American Artisan

The Warm Air Heating and Sheet Metal Journal

Vol. 96, No. 1 CHICAGO, JULY 7, 1928 $2.00 Per Year

WE'RE both in the same boat!

WHEN it comes to the thing that counts most—the actual sale of heaters—we as the manufacturers and you as the dealer, are both in the same boat. If you cannot and do not sell heaters, it goes without saying that we cannot sell any either. That is why it has been the policy of this company to concern itself with the problems of its dealers, to know their needs and to shape our plans to meet their requirements. Of course, it is our job to make heaters that users will approve and endorse, that will build good will for you in your community, but it is also our job to help you sell them. Because we have recognized this, the SUCCESS franchise has advantages for the right type of dealer. Suppose you give us an opportunity to explain what we can do for you.

SUCCESS HEATER MANUFACTURING CO.

Des Moines, Iowa

SUCCESS HEATER

BUILT LIKE A BOILER RIVETED SMOKE-TIGHT

TS200 .A7

To Dealers Who Are Seeking New Connections - - -

UNFORESEEN circumstances and changes in our great industry often cause established dealers to seek new connections. To such dealers we direct this message—

In Central Alabama stands one of America's finest Furnace Plants. It is so scientifically erected and operated that *quality* is insured and quantity possible.

Thru three years this plant has grown and now stands as a leader in the industry. Hundreds of dealers everywhere find the Agricola Franchise a most valuable asset.

If the changes in our industry have affected you and make a change necessary, our message to you is investigate the Agricola Line, which is produced in quantity under scientific and up-to-the-minute production methods.

The Agricola Franchise will prove an asset to enterprising Dealers everywhere. Write for complete information.

GOOD TIMES
ARE HERE TO STAY
—A Business Editorial—

THE Bugaboo of a presidential year is more a mental than an actual condition.

We believe the condition of business today is on a stronger basis than any time in the past two or three years. Let's not allow this mental attitude to slow the wheels of industry.

Agricola announces completion of another extension program. Additional manufacturing space has been added, larger offices will be erected. Production as in the past will continue 100%.

Orders booked by this company the first five months of 1928 total 14% more than entire 1927 business, and 1927 was a good year.

Good times are here to stay. Industry is what we make it.

Agricola Furnace Co

Agricola Furnace Company
GADSDEN, ALABAMA

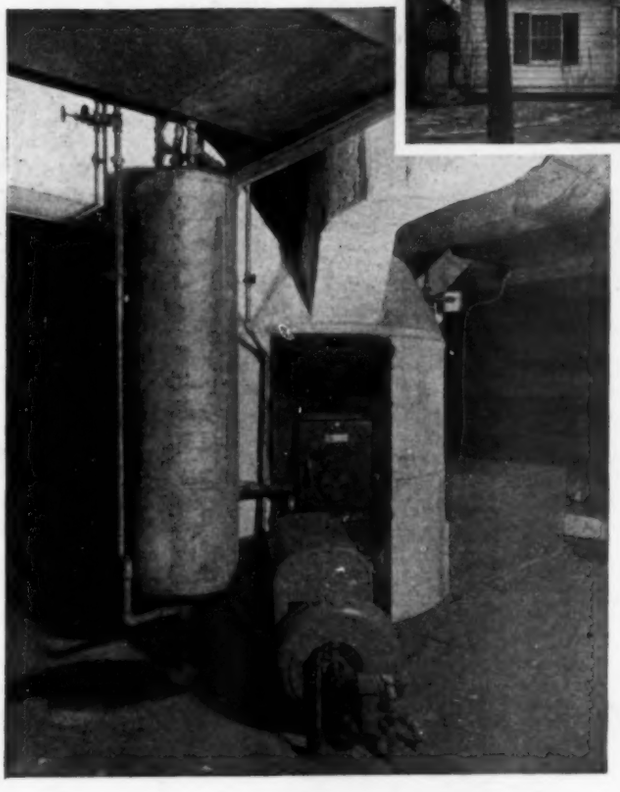
"WARMTH FROM AGRICOLA FURNACES THE SUNNY SOUTH"

GIFT OF PUBLISHER
FEB 9 1929

"Western" BOILER PLATE FURNACES

A North Dakota Western Furnace Installation

W. F. Kurke, Architect
Wallgren & Edlund, Gen. Cont.



THE photograph shows the west front of the house. At the northeast corner an addition 20 by 20, 2 stories, was added in which the first story consists of maid's room and bath and breakfast room. The second floor is devoted entirely to a child's play room.

On the south side of the house a porch 12 by 24 was converted into a sun parlor connected to the living room by a door on each side of the fireplace.

In order to take care of this added space at a distance from the furnace, a Miles Furnace Fan was added. The furnace is also equipped with a Chamberlain Automatic Humidifier and an Oil-O-Matic Oil Burner.

Warm air ducts to north half of house and new addition, not shown.

This installation has given very satisfactory service under severe weather conditions during the past winter.

"Western" Boiler Plate

Built to meet the needs of the average home. Here are some of the reasons:

Permanently gas tight. Built of heavy copper bearing boiler plate, with joints cold riveted and calked, one-piece body construction (without rivets on front extension).

Economical in operation. Designed on a common sense plan, without useless frills, but including the essentials of economical combustion,—hot blast gas consumer, V-baffle in radiator, large brushing surface. The Radiator is extra large with angle support and one piece side wall construction.

Economical in first cost. Although quality is built into every part of the Western, its price is such that it even competes with a cast furnace.

Practical in design, with features which actually add value in service, such as corrugated top to take up expansion and contraction, and heavy double grates which are easily shaken from a standing position.

Time tested in cold northern climates, and absolutely guaranteed.

Ask about the new National Warm Air ratings on Western Furnaces, according to the 4th Edition, Standard Code.

Western Steel Products Company

130 Commonwealth Ave.
DULUTH, MINNESOTA, U. S. A.

Distributed by:

Atlanta, Ga.....Moncrief Furnace Company
Pittsburgh, Pa...Wagener-Proie Furnace Company
San Francisco Pacific..Sheet Metal & Furnace Co.
Ravenna, Ohio.....Ravenna Furnace Company
Chicago-Western Steel & Products Co.....
.....3025 W. Van Buren St.

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A NEW HORIZONTAL TUBULAR HEATER

FOR SCHOOLS, CHURCHES, GARAGES, RESIDENCES, OR ANY LARGE BUILDING— ***JUST THE THING FOR A FAN SYSTEM.***

A heavy, durable and powerful heater of exceptional merit that will be sold only through the trade.

One of the very few horizontal furnaces adapted for either brick set or sheet casings. The only one for wide general use in ordinary basements because of its low construction.

OUR ENGINEERING DEPARTMENT will help you, and there is a large and profitable field in this class of work.

Write for Printed Matter, Prices and Complete Information Today

Floral City Heater Co.

Chicago Office
1654 Monadnock Building

MONROE, MICHIGAN

Detroit Office
4453 Cass Avenue

Announcing—

A *New* and *Better* furnace

In the NEW NESBIT "Moist Heat" (Registered) Furnace

You will find many outstanding selling points, not to be found on any others, and in addition all of the modern features of construction so necessary to the up-building of a successful and lasting heating business.

Write for Catalogue and Our Agency Plan

A few of the Outstanding Features

"Oversize" construction.
Extra large humidifier.
Pouches extend *thru* and *beyond* the front.
Solid one-piece base.
Brass bolts and hinge pins.
Large doors.
Heavily ribbed firepot and combustion chamber.
Upright E-Z Shaker if desired.

STANDARD FURNACE & SUPPLY CO.

Complete Furnace Service At Your Command

OMAHA, NEBRASKA

Cuts Costs, —yours, too

The big improvements of the new Series "C" Moncrief Furnace that cut the cost of heating for the houseowner, cut the cost of selling for you.

Installing costs are cut too. In the Series "C", joints inside the casing are reduced to a minimum and all contact edges are ground and fitted before shipment.

Write for the particulars

The Henry Furnace & Foundry Co.
3471 E. 49th St., Cleveland, O.

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Carr Supply Co., 412 No. Dearborn St., Chicago, Ill.
August Bery & Son, Mack Ave. at Drexel, Detroit.
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Moncrief Furnace & Mfg. Co., Dallas, Texas.
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The Henry Furnace & Fdy. Co., 923 Summit St., Toledo, Ohio.
EASTERN OFFICE
Room 1306, 11 W. 42nd St., New York City
E. L. Garner, Manager

MONCRIEF FURNACES

The Only Thing That Counts!

Combustion chamber—standard code—heating surface—cold air ducts—humidity—all of these things are a part of the sales talk and help to sell the installation, but your customer will judge its efficiency on an entirely different basis.

The only test that counts with the home owner is—"Will the furnace give clean, economical heat under all weather conditions continually year after year—without repairs?" Oral or printed arguments and promises must be backed up with performance.

The dealer who sells and installs furnaces must assume the obligation of picking the furnace that backs up every statement he makes with facts and proof.

The "AFCO" Boiler Plate furnace is that kind of a furnace. They have been manufactured for more than 35 years and thousands have testified to their exceptional cleanliness—economical heating ability and practically negligible repair cost.

If you have the desire for a bigger and more profitable business, send for the "AFCO" plan today.

American Furnace Co.
St. Louis, Mo.

AMERICAN FURNACE CO., A.A.
St. Louis, Mo.

Please send full information and details of the "AFCO" Dealer Plan.

Name .....

Address .....

Why pass up the Big Jobs?

Install the Giant Roto-Blast Furnace

Let us show you how to make big profits by installing Roto-Blast Furnaces. Our engineers will gladly draw up your heating and ventilating specifications. Write for prices and descriptive booklet.

You can easily land them with a Roto-Blast Tubular Furnace. It is used in connection with a Fan System and can be installed in large buildings such as Churches, Gymnasiums, Factories and Garages, where steam installations are now being made.

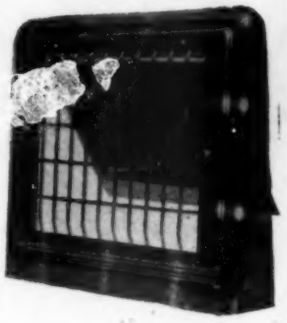
With its sturdy construction, seven square feet of grate area and large heating surface, the Roto-Blast enables you to secure big jobs easily and also gives you the large profits the steam fellows are now getting.

MANUFACTURED BY

THE MONCRIEF FURNACE CO.
ATLANTA, GEORGIA

STEARNS Registers

are liked by the trade because---



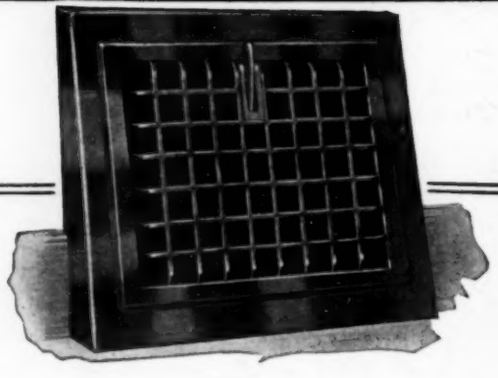
1. ATTRACTIVE—*they please your customers.*
2. PRACTICAL—*100 per cent free air capacity for size pipe intended.*
3. ECONOMY—*they cost less than others.*

Equipped with an operating device that can't get out of order

ALL STANDARD FINISHES

Your Jobber Can Supply You

THE STEARNS REGISTER CO.
1234 Mt. Elliott Ave. Detroit, Michigan



The AUERISTOCRAT

of all registers, combining air capacity, decorative and concealing features.

Designed to conform with the Standard Code so they fit all standard boxes.

Auer Patented mechanical features make it perfect in operation,—quick and easy to install.

Auer's Save Hours and Dollars

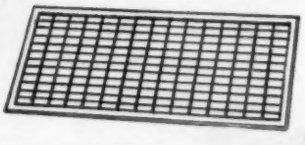
The AUER REGISTER CO.
Cleveland, Ohio

INDEPENDENT

82% Open Area

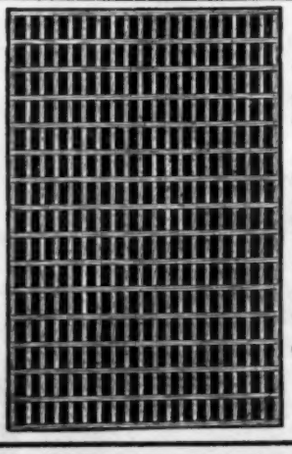
"Fabrikated" Cold Air Faces

Built like a bridge; a minimum of metal sustains a maximum of weight. Any size, any finish, all good looking.



Independent Register & Mfg. Co.
3741 East 93rd Street
Cleveland, O.

Send for Catalog~



AMERICAN WOOD REGISTERS

are thoroughly inspected and before leaving the factory must come up to the

AMERICAN STANDARD,

which assures you the highest quality.

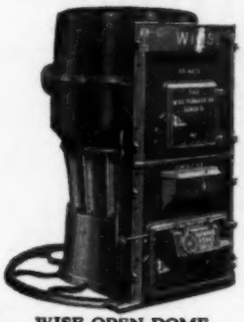
THE AMERICAN WOOD REGISTER CO.
PLYMOUTH, IND.

Say you saw it in AMERICAN ARTISAN—Thank you!

WISE

The Better Furnaces

New WISE Improvements



WISE OPEN DOME CAST FURNACE

THE New Wise Open Dome is improved with the *Wise Cellular Firepot.*

It is *One-Piece* and heavily con e tructed.

It has a series of air cells which extend from bottom to top which enable the air to become pre-heated before entering above and into the fuel. This supplies a continuous and evenly distributed air blast.

Another feature is the Elbow Shaped Flue Collar on Inside of Radiator which is turned up so all of the heat Must follow the castings to the top before entering flue.

WISE 20 SERIES CAST FURNACE

New WISE Ideas

THE Famous Wise 20 Series has added still more fame for itself since this new *Patented* radiator appeared.

The feed chamber and the top radiator are so constructed as to allow communication between them which brings the opening of the fire flues of the radiator directly into the feed chamber, making the flues readily accessible for cleaning through the upper feed door. The dirt falls directly into the fire-pot, eliminating the necessity of taking the soot out by means of a narrow neck passage. This is a big advantage to the owner as a radiator that is easy to keep clean will be kept clean. And this means increased heating efficienc y

This improved Wise ² urnace has a New Cellular Fire Po that provides complete combustion.

a New Steel Furnace

WISE STEEL FURNACE

TO enable you to confine your *quality furnace* business to one house the Wise Steel Furnace was created. Notice that the Wise Steel Furnace is a *better* steel furnace having features that make it *last* longer where others have weak spots.

The bottom of the radiator on the Wise Steel Furnace has a *Cast Iron Soot Box and Clean Out.*

This you know is the big weak spot in other steel furnaces

The Wise Steel Furnace like all Wise furnaces is *Guaranteed* high quality. It possesses all the latest scientific heating features and all modern conveniences. It is *riveted* and *welded* and has *special design grates.*

Write for the new Wise catalog, No. 23, just out and special circulars illustrating these New Wise Furnaces and features in detail. Be a Wise dealer now and for all time.

The Wise Furnace Company

AKRON, OHIO

Oil fired furnaces and boilers, as well as coal fired furnaces and boilers, can be cleaned with the Sturtevant.

THIS QUICK WAY

Makes Cleaning Business MORE PROFITABLE

HEATING engineers can increase their profits one half to two thirds by handling a larger volume of cleaning business. The Sturtevant Furnace Vacuum Cleaner opens the way. There's real profit in cleaning furnaces the vacuum way because it's quick and efficient. Cleaning jobs not only give you a good profit but give you an opportunity to sell more repair parts and also increase the sale of new heating plants.

The Sturtevant cleans all kinds of furnaces and boilers. It is the quickest and most thorough cleaning device on the market. Also the lightest in weight and the easiest to handle. It has only one moving part, the fans, revolving on the same shaft with the motor. The shaft runs in self-aligning ball bearings. The dust bag, bearings and fans are protected against injury by a metal collector and baffle plate inside of the front cover which stops all dirt, soot, ashes and heavy particles from reaching the working parts and allows only the dust to enter the dust bag. 99% separation is guaranteed.

Don't delay investigating this quick, thorough way to clean heating plants. Hundreds of heating engineers are reaping large profits with the Sturtevant. Write now for further information. Use the coupon below.

Agents wanted for territories in Indiana and west of the Mississippi. Submit qualifications.

Sturtevant

(REG. U. S. PAT. OFF.)

HYDE PARK, BOSTON, MASS.

Dept. AA623

B. F. Sturtevant Company,
Hyde Park, Boston, Mass.

Without obligation to me, send along further information and price on the Sturtevant Portable Furnace Cleaner.

Name .....

Address .....

City..... State.....

Founded 1880

Published to Promote Better Warm Air Heating and Sheet Metal Work

American Artisan

The Warm Air Heating and Sheet Metal Journal

Yearly Subscription Price:
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Vol. 96, No. 1 — CHICAGO, JULY 7, 1928 — $2.00 Per Year

Table of Contents

"THERE IS NO LAW"

There is no law that requires men to compete with each other upon an unprofitable basis.

There is no law which prohibits you from getting as much or more for your goods as your competitor.

There is no law which prohibits you from informing your competitor as to the prices and terms at which you are selling your goods.

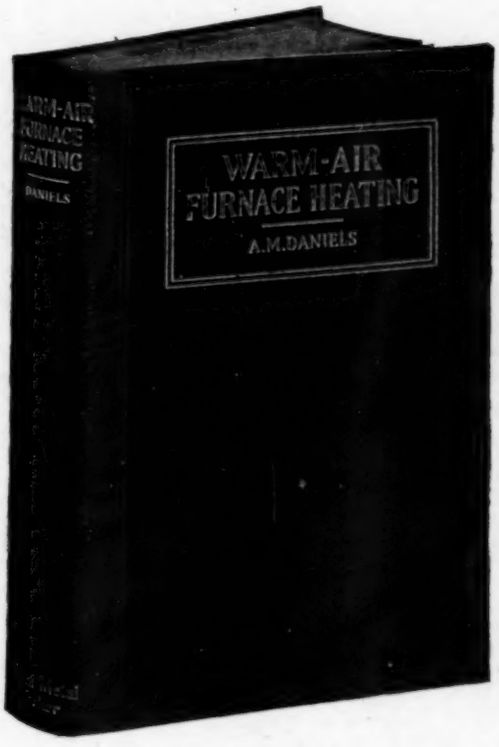
There is no law which prohibits you from having confidence in the information which your competitor gives you.

There is no law which prohibits a manufacturer from suggesting a resale price by jobber to retailer, on his products, and if such resale price provides the jobber with only a fair profit.

There is no law which prohibits the manufacturer from refusing to sell jobbers who do not respect such a resale price.

There is no law prohibiting a jobber from refusing to buy from a manufacturer who does not establish a suggested resale price on his products.

A New Book on Warm Air Heating



IT IS the book that thousands have been asking for—a book on Warm Air Furnace Heating that is UP-TO-DATE—a book that covers every phase of the subject giving exact data based on research work

Written by A. M. Daniels.

Here is the book that will enable both the experienced furnace man and the student to obtain a working knowledge of up-to-date scientific warm air furnace heating.

Read over the Chapter Headings—notice the complete treatment of the subject.

Many tables are included and some big labor savers in calculating pipe sizes—also many diagrams.

Chapter Headings

1. Historical.
2. Typical Gravity Pipe Warm-Air Heating Systems.
3. Types of Warm-Air Furnaces.
4. Details of Furnace Construction.
5. Heat Losses.
6. Effect of Register-Air Temperature, Leader Area and Size of Wall Stack Upon Heating Effect Produced.
7. Insulating Coverings and Their Effect Upon Leader and Wall Stack Operation.
8. Casing Diameter vs. Furnace Capacity.
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10. Furnace Capacity and Rating.
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20. Leader Pipe Sizes.
21. Forced-Air Furnace Heating.
22. Coal as Fuel.
23. Pipe and Fittings.
24. Warm-Air Registers and Cold-Air Faces.

450 pages, 7x9 inches

Bound in semi-flexible imitation leather--

Stamped in gold--

PRICE $5.00 POSTPAID

Send in your order today

AMERICAN ARTISAN,
620 So. Michigan Ave., Chicago, Ill.

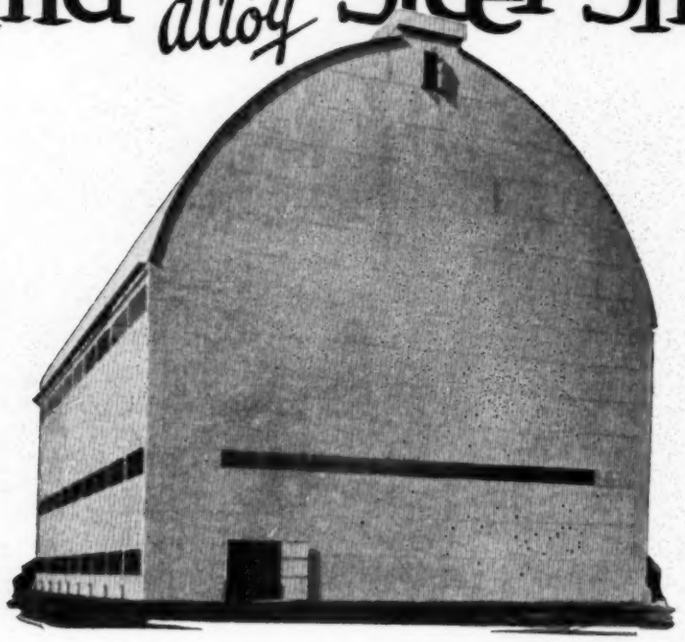
Enclosed find $5.00 for which send me WARM AIR FURNACE HEATING by A. M. DANIELS.
10% discount allowed on book and new or renewal subscription if ordered together.

Name.....

Street Number.....

Town.....*State*.....

Inland Copper Alloy Steel Sheets



U. S. Government Dirigible Hangar at Grosse Ile, near Detroit, Michigan, completely covered with Inland Copper Alloy Galvanized Sheet Steel.

The Verdict *of the* Elements

Twelve years ago, the American Society for Testing Materials, an unbiased scientific and technical organization, placed a variety of unprotected black sheets in racks at Pittsburgh, Pa., Fort Sheridan, Ill., and Annapolis, Md., to determine which of the various materials exposed, best withstood rust and corrosion.

The verdict was *Copper Alloy Steel Sheets.* They far outlasted all other steel and iron sheets in resisting the onslaught of the elements. No other grade was comparable.

This is why we so strongly recommend INLAND COPPER ALLOY STEEL for all exposed uses. It can be furnished in Blue Annealed, Box Annealed and Galvanized Sheets.

INLAND STEEL COMPANY

38 South Dearborn Street
CHICAGO

Branch Offices: ST. LOUIS MILWAUKEE ST. PAUL KANSAS CITY

Contributing Member: SHEET STEEL TRADE EXTENSION COMMITTEE

Sheets · Bars · Plates · Shapes · Rails · Track Accessories · Rivets · Billets

When writing mention AMERICAN ARTISAN—Thank you!

American Artisan
The Warm Air Heating and Sheet Metal Journal

Vol. 96 CHICAGO, JULY 7, 1928 No. 1

Ride the Wave, But Don't Let It Swamp You

Business Methods Must Change With Changing Times

"BRAINS and industry alone are not enough to underwrite success in business today. The added ability to make almost overnight changes in order to keep up with swiftly changing conditions is a very essential factory in many lines," says the Corn Exchange issued by the Corn Exchange National Bank, Philadelphia.

"Henry Ford piled up hundreds of millions building one type of car and painted no color but black. It seemed nothing could block the progress of Ford along the road he elected to take, but public taste suddenly asserted itself and popular fancy for frills and different paint caused Mr. Ford to scrap the thing out of which he had made a billion dollars, and it cost many millions to switch over to a new model with all of the colors anybody desires.

Must Follow Trend of Public Desire

"Taste in shoes changes oftener than taste in autos. Every day sees a new kind of footwear for milady. It has much less leather but far more labor in it than the old type of shoe.

"One bathtub is as good as another for the purpose of having a bath, but one tub is 100 per cent better than another in the prime matter of selling it.

"The maker who should stick to last year's model of straw hats might go bankrupt in 1928. Yet no one will pretend that the 1928 hat will wear longer or is any better to look at in its way than was the 1927 model.

"Things have changed, and the manufacturer and merchant must reckon with that most variable of all unknown quantities—public preference.

"When ladies elected to wear small felt hats they made an awful dent in the large industry of manufacturing artificial flowers.

"No profit in groaning over 'good old times.' No dividends can be gathered by bemoaning the fact that things are not what they used to be.

"Every business and every industry must try to keep apace with what the people who put up the money prefer to buy. Better still, keep one leap ahead.

"Rail against abbreviated skirts; the ladies still wear no other kind. No merchant will try to sell a long one just because that was the kind his wife used to wear.

Industry Competing Against Industry Today

"Like not only competes against like in these bustling days, but it competes against rank outsiders. Rayon is the chief competitor of cotton and of wool, although only a little while ago it was unheard of.

"Cement and concrete compete with granite and brick. Once the bricklayers competed only against each other.

"Marconi says that just around the corner stands radio ready to put out of business ocean cables. The radio will flash an entire page of manuscript 3,000 miles as quickly as the telegraph wire can send a single word.

"Consider the advent of the motor bus and what it means to transportation facilities! What of the airplane and the position it will assume before long?

"'Behold all things have become new' is quite as true as when that thought was uttered nineteen centuries ago.

"Would anybody in Philadelphia now buy milk as it was peddled not long ago from cans carried about in wagons?

"Things must not only be better, but better handled, boxed, barreled, sorted, sized, labeled and wrapped.

"Grandmother never got a box of candy in her life. They sold candy, if at all in her day, in little scoops

TRADE ASSOCIATIONS

The trade association itself today can justify its existence only by proving it is as much a business institution, managed in a business-like way, as are its individual members. Sixty per cent of all activities of the business world today are really beyond the control of any individual, because they can be fully developed only through collective enterprise. I refer specifically to such items as credit, merchandising programs, shows and trade exhibitions, and similar essentials for national distribution of goods in this era of giant competition between industries. The trade association is taking on entirely new functions, because of changing conditions, and is rapidly becoming the "general staff" in the new battle for business.

—B. W. Ruark.

and tied up in brown paper. They still sell cigarettes that way in oriental countries, but who could sell them in such fashion in Philadelphia?

"The biggest maker of hooks and eyes in the world stated that it costs six times as much to string these hooks and eyes upon pasteboard to please the lady customer as it costs to manufacture the hooks and eyes.

"Fashion changes every hour and buys only what it likes. It also uses a club to whack the merchant who refuses to meet its whirling whims.

Advertising a Powerful Factor in Guiding Human Desires

"It is conceded by the livest men in every trade that advertising is now the most enlightened salesman. Those who fail to hitch this best salesman to their own business must lag behind competitors who do. One auto company, which last year spent $9,000,000 in advertising, in 1928 will spend $30,000,000 in advertising.

"Consider the banking business. The old-time banker was more or less remote, isolated, taciturn and kept in his shell. Not so today. The really modern bank is ready and equipped to perform many kinds of the most valuable service which the old banker never dreamed about, let alone performed.

"It is the business of nearly every business today to create new wants. Having something new and desirable stimulates trade and increases purchasing power.

"The Hottentot requires no blanket, no coal, no overcoat, and picks his dinner from a tree or bush, lives a life of ease, but he never built a stone house, paved a road, spanned a river with a bridge, wrote a book, opened a school, set a fractured bone or made any kind of history.

"The races which are seemingly most extravagant—and Americans hold first place today with nobody else in sight—grow richest at the fastest rate.

"Housework is today a domestic science, and the cook is the monarch of all she surveys, but more people are dining out, and restaurants are doing a relatively greater amount of business than ever in their history.

"It would be as difficult for any store today to sell a rat for a lady's front hair, false bangs or a bustle as it is to peddle fans among the inhabitants of Greenland.

Stagnation of an Industry Due to Executives' Mossiness

"No one period of time in our country's history can begin to compare with the decade following the World War in the astonishing changes that have been wrought in business enterprise through the influence of new ideas and fashions. As a matter of fact, the stagnation of many old lines of business is attributable to the neglect of the management to keep up with the procession in these respects.

"Every big industry in the United States is trying to get more of its employes to buy a share of the business. And thousands of workers today are owners of stocks and bonds who prior to the World War did not know whether a dividend was a disease or a new game.

"This scheme of worker-ownership puts a complete new phase upon the industrial moon. Toilers elect directors and so help manage the concerns they work for.

"The American machine is changed every day to do more and also to accomplish more wonderful results. With the same number of hands, auto makers now turn out 200 per cent more cars than they could do only ten years ago.

"Railroads last year handled more traffic than they did seven years ago and with 400,0000 fewer men on the payroll.

"Such an apparently simple thing as lighting a factory may mean 12 per cent difference in output. It has been proved by actual experiments.

"Manufacturers used to make their own conditions. Now conditions largely make the manufacturer.

"Philadelphia eats four times as many oranges as it ate only a few years ago, thanks to the enterprise of orange growers who coaxed the public into eating more fruit. Fresh fruits and vegetables are whisked 4,000 miles in refrigerator cars at express-train speed. No wonder you eat three tomatoes now where you once got along with one!

Public Buys Freely of Non-essentials—Make Them Take Essentials

"The public buys as freely of non-essentials as they buy bread and meat. 'Make them want it' is the slogan used by all winter and summer resorts, steamship companies and tourist agencies. These resorts flourish as mightily, often more so, than a factory town which never takes the pains to cater to the whims of those who have money to spend.

"Luxury cash flows more freely and in as great flood as does necessity money. And the luxury dollar is spent without a groan and minus a kick.

"Paris for a century and more has thriven upon the outside world's luxury dollars spent there so freely. But the cash is just as good to the Frenchman as that other cash which comes more slowly from the sweat of its industries.

"The tide will not stop at any man's commands. The wise ones will ride the waves and not be smothered beneath them."

Purchasing Power of Dollar Now 62.1 Cents

The purchasing power of the dollar as compared to pre-war living costs is now 62.1 cents, according to the National Industrial Conference Board. This figure is based on the amount of food, clothing and shelter the average wage earner may buy now, as compared to the amount he might have purchased in 1914 with the same money. The building materials dollar has a greater value, being practically the same now as in 1919. Labor costs for the past two years have been stationary and indications are that they will remain so for the present year. This item brings the building dollar slightly below the pre-war value or at approximately 95 cents.

Patterns for Boxes Require Strict Attention to Detail If Accuracy Is to Result

Economy of Metal or Appearance Desired Governs Style of Patterns to Make

By O. W. Kothe, Principal St. Louis Technical Institute

THE making of square-cornered boxes, tanks, pans, hoppers, etc., ranks next to just the plain straight work. Let us start with the plain square box indicated in sketch No. 1.

In making shallow pans, boxes, tanks, etc., from an inch or so to about six inches deep, the general practice is to cut out the entire pattern from one sheet of metal. Thus, in our case we have a pan 12 inches wide 20 inches long and 4 inches deep. Now on ordinary thickness of metal the pattern can be laid out as we show, where the corners will be waste.

The thickness of the metal generally governs the seams made at the corners, and the size of pan or box, together with the thickness of the metal, governs the style of reinforcement along the top edge. Sometimes a wooden box is metal lined, as at a, of details "A," when a top edge is allowed for hammering over to nail down. Or in small pans, the hemmed edge b, is often used. But no doubt, the wired edge is the most popular of all with the lighter metals. Here we lay out the pattern to net measurements as our layout shows. Then we allow an additional edge equal to 2½ times the thickness of the wire or rod. Observe, if we use a ¼-inch rod, the wire edge would be equal to ⅝-inch wide since 2½ x ¼ = ⅝ inch. This will be just enough to curve around the wire and close against the side of pan.

Observe a full circumference of the ¼-inch rod would be equal to 3.14 x ¼ = .78 or about 25/32 inch. But since we measure to the top of the wire, a portion equal to about 1/16 or so is not needed, since only a fraction over half of the rod is covered then by the roll. However, by allowing 2½ times the diameter of all rods or wires or pipe sizes, a perfect roll can be made. Most workmen spoil the pan on enclosing the wire, by allowing an unequal edge to shape itself around the wire. Near the corners, the edge is short, while toward the middle, the flange material is increased. This makes a pan with an uneven top edge, and the sides also look bad.

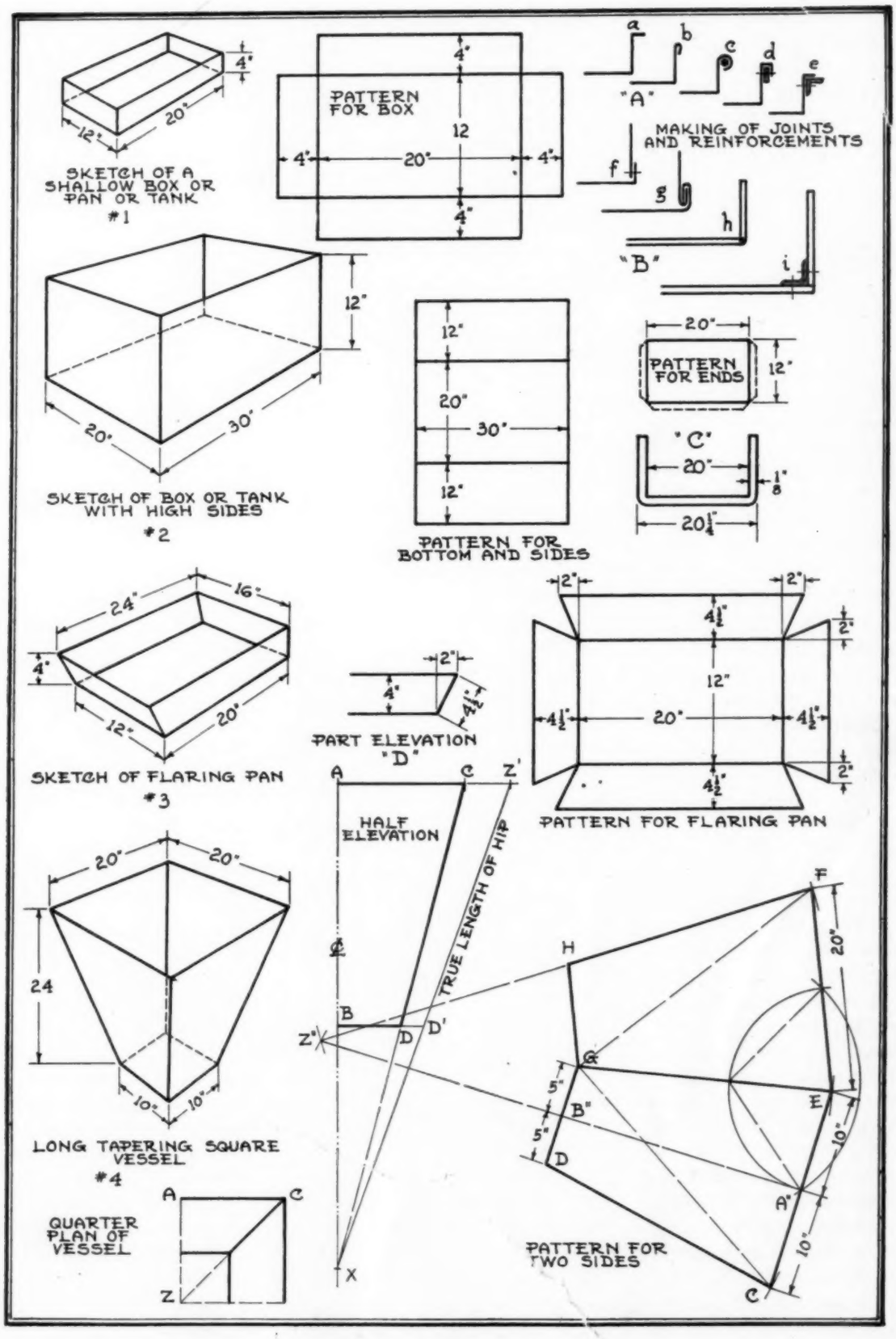
On other jobs, a flat band iron bar is enclosed, as at d, while where greater stiffening is required an angle bar is riveted in place, as at e. However each of these methods of reinforcing the top edge is governed by practical judgment—what the pan is used for, the resistance it must support—the general practice of the shop, etc. In regard to making the seams on the corners, the more popular seams are made as at f and g of detail "B." This is more for lighter metal, although heavy metal can also be flanged as at f. But in either case, edges accordingly must also be allowed where we show a clear cut away corner. On heavier metal, as 20-gauge and heavier, the corners are now being welded, more and more. Each shop making more and more use of its welding outfit, and so corners are welded as at h. On jobs where considerable stress is met with, then angle iron bars as at i, are riveted in the corners, which gives strength as well as weight.

We should say that it takes considerable skill to make good seams, as at f and g. Most workmen have the idea to use a large wide seam, they will naturally have a strong joint. But to use comparatively narrow flange edges, as the type f, a much better job can be made. The width of the flange is governed by the thickness of the rivet. In most work to allow only 1½ times the thickness of the rivet a sufficiently wide edge is made on each side of the rivet line. To allow too wide an edge only gives trouble in making the metal lay up tightly. In the flanging process it stretches and this can seldom be worked out satisfactorily.

The same is true of seams as at g, for thin metal a narrow seam of not over ⅛-inch is necessary as the metal becomes heavier to possibly 16-gauge, then a ⅜ to ½-inch edge may be necessary. But it is seldom such double seams are used on metal heavier than 20-gauge. For such a ¼ to 5/16-inch seam holds all that will ever be expected of it. In fact, small edges are more easily hammered over, and they always present a neater appearance. A person can do more with narrow edges than with wide ones, mainly in taking out buckles, and it always lays up well.

Tanks with high sides as in sketch No. 2, have a different element entering, mainly in the laying out process. Here to lay out a pattern as we did for No. 1, the metal wasted in the corners would be considerable. The guiding factor is generally, which is the best economics—to waste some metal, or to make seams. If it is more efficient as well as better workmanship to make several long seams along the several corners, then that is best. But if appearance is of no importance and waste is slight, then tanks are made of considerable depth like we show at No. 1.

However, the better practice is on all such tanks or boxes as at No. 2, to layout the pattern as we show at the right. Here the sides and the bottom are made of one sheet, while the ends are seamed on by one



Patterns for Boxes.

method or another as indicated by details "B." In making boxes this way, the ends can generally be set in easier than the sides, since long seams are always more awkward to handle than short ones. On quite large tanks, the bottom is generally made separate, and the sides and ends are built in by seaming, riveting or welding.

Where tanks are made of metal and thickness is a factor, as in de-

tail "C," always seek to use inside measurements, unless outside measurements are specified. In this case we see a ¼-inch difference is made by using ⅛-inch metal. Observe, in the bending process, the jaws of the brake are clamped on the line, so a right angle bend causes the metal to stretch to form the bend.

Flaring plans as at No. 3 are also something every mechanic must make. Some workmen have difficulty in arriving at the flare and so make one side of a greater slope than others. Such work always indicates a lack of geometrical knowledge of measurements.

There are still a larger number of men who will make the pan—that is they will make something; but it is not according to measurements in every particular. So many when told to get out a flaring pan as we show in No. 3, which is 4 inches high—they make the sides 4 inches. In most cases accurate check-ups are not made and if it is found a bit shallower than specified, it is ascribed to the wire edge—it took more material around the wire than they figured. But this is wrong, and may be they were short there also.

In most cases, mechanics merely accept the height specified or 4 inches in this case. They do not draw a part side elevation view as we show at "D." Men who can figure the slant line of a triangle, don't need to draw the elevation. Thus, if our height is 4 inches and our flare is 2 inches, the true length of the sides will be: $4 \times 4 = 16$

$2 \times 2 = 4$

20

Now to extract the square root from the sum of the square of the altitude and the base, we have:

$\sqrt{20} = 4.5$ inches as the length of side.

To this must be added the edge for reinforcement, if a 3/16 wire is used; then $2\frac{1}{2} \times 3/16 = 15/32$-inch, or practically ½-inch. The idea in laying out such flaring pans, is first to determine correct measurements for the slant height, and the wire allowance. Using mathematics is more accurate than using geometrical diagrams, since the pencil thickness always allows for inaccuracies.

Next lay out the bottom 12 x 20 inches in this case and draw the lines. Then add the side lines 4½ inches, after which add the wire edge. The flare is measured over whatever it should be. Most measurements for such work are given for outside top measurements, since the pan must fit in given places. Hence to use a 3/16 wire, and say thin metal of 26-gauge, the roll will measure about ¼-inch, but for safety we call it 5/16 inches. Then two rolls, one on each side will be ⅝-inch and if our top could measure, say $24\frac{5}{8} \times 16\frac{5}{8}$, with 2-inch flare and 4 inches deep, we can easily arrive at our bottom measurements of 12 x 20 inches. From the square lines the 2-inch flare is measured over, and that gives the bevel cut. Edges can also be allowed as becomes the seam made.

The main reason such simple articles give trouble to workmen is that they have never thought out the geometry on which such work is based. Men who do things by memory or not even that have no opinion of basic principles, and so no big accomplishments can be expected of them. Geometry requires visualization and visualization can only be acquired by practice drafting and the making of models.

Square hoppers as at No. 4, are quite similar to the flaring pan, only the depth is increased. Work of this kind can be laid out in several ways, but in general the seams are made on the corners, thus using only one pattern for the sides.

The main item in such work is to determine the true slant length of the sides. Hence a half elevation is often drawn, where A-B is the depth; while A-C is half of the large base, and B-D is of the small base. Then, C-D is the true length of the sides. This can also be determined mathematically, where we subtract B-D from A-C, as 10 — 5 = 5 inches of flare. The depth is 24 inches, so we find the sum of the squares of the base and altitude and then extract the square root. Thus: $24 \times 24 = 576$

$5 \times 5 = 25$

$\sqrt{601} = 24.51$

inches.

This is the true length of C-D of our half elevation, and is used to set out the pattern by measuring on line A′-B″ as 24.51 inches. From this center line, square out lines D-G and C-E, measuring 5 inches as B″-D and B″-G, also measure 10 inches as A″-E and A″-C. This enables drawing the hip line C-D and E-G, and is the pattern. This can be cut out, and others marked off, or as many sides as desired can be added. This can also be done in several ways.

One way is to use E-C as radius, and strike an arc as at F. Then use G as center, and G-C as radius arc at F. Then use G-D as radius, and strike arc at H, after which use the hip line E-G as radius, mark off the line F-H.

Another way is to use E as center and strike an arc, crossing center lines as at A″. Next reset compass to the intersection on hip E-G to A″ as radius, strike an arc as shown. This enables drawing line E-F through the intersection. This method works on the principle of drawing G-E-F to the same bevel as the angle G-E-C contains. After this G-H is drawn parallel to E-F.

Still another way is to use the sweep method, similar to a pitched cover where the arc passes through the corner of the hips. For this a quarter plan is drawn and in picking the hip line Z-C of plan and setting as A-Z′ of side elevation. Then line Z′-X will be the true length, while Z′-D′ is the true length of hip. So that by extending the center line A″-B″ to Z″, which is equal to the side elevation line C-X, we can then use Z″ as center and Z″-E as radius, and strike the arcs through which points F and C, also radius Z″-G will strike arcs for H and D to pass through. In this way the pattern can be developed much the same as those of a tapering pipe.

Another method that can be em-

ployed is triangulation, although in the last two methods we have used semblances of it. From this it is evident that there are numerous ways of accomplishing the same thing—much like killing a cat. You can shoot it, poison it, chloroform it, burn it, etc., etc. Each method will do its work effectively in the end; all of which teaches us to use the most direct method.

So many tradesmen have this fever so bad that they cannot muster enough patience to do their work accurately or neatly, especially in drawing. It is a common practice to see perfectly good drawings ruined by impatient finishing. They prefer not to use compasses to describe true arcs, or to use the proper methods for drawing straight lines, but rather sketch them in with a rough free hand. They think that goes a moment quicker; but at the same time they spoil their entire work—it is botched up.

Vincennes Meeting of Indiana Warm Air Heating and Sheet Metal Men Successful

Next District Meeting to Be in New Castle in September

THE district meeting of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana at Union Depot Hotel, Vincennes, June 29, was preceded by a directors' meeting attended by President Waters, Vice-President F. E. Anderson, Treasurer Charles E. Tharp, and Directors H. A. Beaman and Thomas Ewing. It was agreed that the district meetings were quite successful and were operating in just the way that it had been hoped that they would.

Next Meeting to Be at New Castle

It was unanimously voted to have two more district meetings before the state convention in Indianapolis on January 23, 24 and 25, 1929. The eastern part of the state was selected for the next meeting and after some discussion, New Castle was decided upon as a point which would be convenient to Connersville, Richmond, Anderson, Muncie, Portland, Winchester, Rushville and a number of smaller towns. Elmer Livezey of New Castle, was made general chairman and instructed to proceed immediately with his arrangements. The date was set for Friday, September 14th, the gathering to be a dinner followed by a general meeting, all sheet metal and warm air heating contractors in that section of the state being invited to attend both the dinner and meeting. As at other district meetings, the jobbers, manufacturers and trade papers are invited to send representatives.

Another district meeting was projected for December 7th, probably in the northern part of the state, the exact location to be decided upon later.

Homer Selch

The executive secretary was authorized to get out a roster of the membership, flanked by a business directory, similar to the one the Indianapolis association has just completed.

The executive secretary asked the advice of the directors on the matter of a membership campaign. After some discussion, the directors agreed that September 1st would be a good date on which to start. It was suggested that a prize be offered to either Furmet or other person writing the greatest number of members. A Gladstone bag was named as a possible attractive prize. The directors thought that it would be well to score the same for renewal of membership, accompanied by payment of 1929 dues, as for an entirely new membership. New members coming in between September 1st and January 1st will be credited with full payment of dues up to December 31st, 1929, on payment of one year's dues.

President Waters laid before the directors for their future consideration the matter of districting the state with provision for the election of one director from each district. This matter will be taken up for disposition at a later meeting after the directors have had time to give it thorough consideration.

The directors found awaiting them in the dining room an enthusiastic and noisy, although not disorderly, group of contractors. W. C. Teschner started out as master of ceremonies, but early in the evening turned over the job to President Waters. After enjoying a good dinner the contractors were entertained by some brief explanations of what the state organization was trying to do, together with some of the advantages of both state and local organizations. President Waters in an unexpected flow of oratory paid just tribute to the past history of Vincennes and to her present prosperity and spirit. He was followed by others prominent in the trade who brought out many points of interest and value. W. C. Teschner uncorked some poetry and monolog which proved he had exceptional ability as an elocutionist.

Among Those Who Took Part in the Meeting Were:

Byron Mills, Vincennes.
A. L. Gotman, Terre Haute.
J. Clarence Watson, Vincennes.

H. R. Jones, Indianapolis.
Wm. Stewart, Indianapolis.
J. T. Pope, Indianapolis.
Thos. Kilfoil, Jr., Vincennes.
James F. O'Connell, Terre Haute.
C. W. Lauby, Vincennes.
Paul R. Jordan, Indianapolis.
T. R. Lavery, Indianapolis.
Frank E. Anderson, Terre Haute.
H. A. Beaman, Allred Mfg. Co., Indianapolis.
O. A. Nichols, Indianapolis.
A. W. Dudley, Terre Haute.
M. Class, Indianapolis.
Elmer Livezey, New Castle.
Thos. Ewing, Huntington.
H. A. Harmening, Terre Haute.
A. T. Fleming, Indianapolis.
Edw. J. Ottensmeyer, Vincennes.
O. L. Black, Vincennes.
Orville R. Newell, Lawrenceville, Illinois.
James A. Thomas, Indianapolis.
Chas. E. Tharp, State Treasurer, Fort Wayne.
Harry B. Peterson, Indianapolis.
W. S. Waters, State President, Indianapolis.
W. C. Teschner, Vincennes.

Indiana Sheet Metal to Hold Picnic July 26, 1923

The Indianapolis Sheet Metal and Warm Air Heating Contractors Association have set the date of their annual picnic for Thursday, July 26, 1928, at Long Acre. Following the custom of former years they will welcome representatives from other associations, as well as from trade papers, the jobbers and manufacturers and all branches of sheet metal and warm air heating trade. It is hoped that there will be a large attendance of salesmen.

SPOT NEWS

W. A. Fingles, Inc., 29 S. Howard Street, Baltimore, Maryland, has the sheet metal contract for the $500,000 Frederick Bauerschmidt Memorial building of Union Memorial Hospital, in that city. The structure is one of the latest triumphs in architects.

The Kofakl Sheet Metal Works, 111 Murray Street, Dallas, Texas, has been awarded the sheet metal contract for $125,000 clinic and hospital for Dr. E. O. Rushing Medical Arts Building, in that city.

Ace Signs, Inc., Florida Arcade, St. Petersburg, Florida, is in the market for galvanized iron sheets 36x96 inches.

The Kittle Manufacturing Company, of Los Angeles, California, has opened a sheet metal, auto and camp accessories business at 149 New Montgomery Street, San Francisco, California.

The Sheet Metal Company has engaged in business at 4360 Mission Street, San Francisco, California, under the management of E. A. Scholtz.

The Western Metal Products Company, sheet metal, has moved its business from 367 Ninth Street to 1160 Bryant Street, San Francisco, California.

Theodore H. Phillips has established a sheet metal business in Chiloquin, Oregon.

The Capital Furnace Company, of St. Paul, Minnesota, has changed its name to Twin Cities Furnace Company.

The Midwest Heat Regulator Company, 3318 East Lake Street, Minneapolis, Minnesota, has plans for a 3-story and basement 39x45 ft. factory building, and will begin construction this summer.

A. O. Aberts, of Elbow Lake, Minnesota, has the contract for the furnace for the Lutheran church, Ashby, Minnesota.

The Campbell Furnace Company, 3143 Dean Street, Des Moines, Iowa, has the furnace contract for Lutheran church in Benson, Minnesota.

C. C. Ferguson, 809 Torrey building, Duluth, Minnesota, has the contract for ventilating system for Senior High and Technical School in Gilbert, Minnesota.

The American Foundry & Furnace Company, 805 36th Street, Milwaukee, Wisconsin, has the furnace and sheet metal contract on new school building in Burns, Wisconsin.

The Powell Hardware Company, 621 St. Germain, St. Cloud, Minnesota, has the warm air heating plant contract for First Lutheran church in that city, and the Lander Hardware Company, 18 6th Avenue, South, has the sheet metal work on the same building.

The Charles J. Strangman Company, Los Angeles, California, has been awarded the sheet metal contract for Science Building at University of Southern California. The California Fireproof Door Company has the contract for the tin clad and kalamein doors for same building.

The Pasadena Sheet Metal Works, 57 West Union Street, Pasadena, California, has the heating contract for residence of Mrs. Everett, at that point.

R. Bancroft & Sons have the heating and ventilating contract for the John Muir school in Merced, California.

Wm. M. Brooks, 859 South Alvarado Street, Los Angeles, California, has begun construction of 50x105 ft. tin shop, to cost $10,000, at 819 North La Brea Avenue, Los Angeles.

The Louis S. Rysdon Company, Chicago, has the sheet metal contract for the Burwell Annex, Knoxville, Tennessee.

Falb & Son, Forest City, Iowa, have the hot air furnace contract for school house at Miller, Iowa.

Meyer Leson and Jacob Leson have engaged in business at 2940 West Street, Oakland, California, under name of Oakland Sheet Metal Supply Company.

Fiuren & Arneson, 2919 Union Street, Oakland, California, have the sheet metal contract for warehouse of the Howard Company, that city.

The Faris-Osborne Company, Inc., 720 Tehama Street, Fresno, California, has the sheet metal work and roofing contract for hospital building of Sisters of Holy Cross, Fresno, Cal.

Walter Mork, 1814 San Pablo Avenue, Berkeley, California, has the sheet metal contract for the Garfield School building.

Ladies' Auxiliary National President Has Message for Members

Dear Member:

The convention at Cleveland is over and was a great success in many ways.

The Ladies' Auxiliary increased in membership with a very gratifying result.

Our meetings were all that could be expected; well attended; many points brought up, discussed and settled in a very satisfactory manner.

The social functions were, indeed, many and very enjoyable, and as a whole was a benefit to all who attended the convention.

Mr. and Mrs. Schott and Mr. and Mrs. Daringer of the Louisville party, who met with an automobile accident enroute to Cleveland, are home again and doing nicely and will be with us in Baltimore next year. Oh no, that little mishap didn't scare them.

Now, we must get busy and see what we can do for our Local Auxiliary, and I am going to ask that each lady consider herself a committee of one to do something to boost her auxiliary. Let me know what you are doing and if you need help, tell me.

I also want to ask that your reporter try and have news items of what you are doing, at least once a month, and send to the AMERICAN ARTISAN, Chicago, for publication.

Mary A. O'Leary,
President.

Filing of Duplicate Bids One Means of Stopping Bid Peddling

A country-wide survey made by the National Association of Builders' Exchanges reveals that in five exchanges general contractors file duplicate bids with the organizations for public posting as a protection against bid peddling. While 37 exchanges reported that they do not follow this practice, 26 stated that they believed the policy a good one.

Four exchanges reported that the bids of subcontractors were likewise filed with association headquarters, while 38 reported that subcontractors did not follow this practice. Open and above board posting of bids after the formal opening by the architect has been highly beneficial as a means of making the first price the last price, we are informed by those contractors who have maintained the system in their organizations.

Alex Richter Offers General Suggestions for Production of Business

Alex. Richter, proprietor of the Richter Galvanized Sheet Iron Works, Holyrood, Kansas, has something of importance to offer other sheet metal men who are anxious to increase their business. He writes as follows:

"To AMERICAN ARTISAN:

"In this letter it is my object to inform the readers of AMERICAN ARTISAN that I have several products that can be made in other sheet metal shops and may provide more business to some who may see and find it interesting to them.

"Years ago I used to make tinware for the community of Holyrood. Tinware got to be a thing of the past, and furnace work in my country is of limited demand. So I was really without employment for a time and I had to put my knowledge to work on what I know of the sheet metal line, and the first thing that I began to make was the sub-irrigating pipe. Of the same I used to make a good many thousand feet. When sheet steel got too expensive during the war I gave up the idea of my sub-irrigating pipe and centered by attention on stock, storage tanks and cistern tanks.

"Then I used to make a lot of well casing from the time I first went into the sheet metal business, and finally the screw casing came in the market and it cut my sales short. In order to keep up I had to use my knowledge again and get a screw casing made that would be better than the one on the market. This I managed to do and today I feel at ease, for I have now a trade worked up that takes in a good many miles and I don't have to worry. All that I have got to do is to meet competition, and this I am able to do also, for I managed to get enough trade so that it paid me to buy my galvanized sheet metal in carload lots, and I manage to keep on improving my business.

"It is my intention to inform any man in the sheet metal line who is able to make use of any one of the items that I make mention of, for I can not take care of all that is away from my home and I want to do what I can for my fellow workman."

Floral City Heater Has New Horizontal Tubular Furnace

Believing that the trend of big building heating is gradually swinging back toward the warm air field the Floral City Heater Co., Monroe, Michigan, have recently announced an addition to their line of a horizontal tubular heavy duty furnace to meet these conditions.

In keeping with their established policy this furnace will be marketed only through the trade and will be adaptable especially for fan jobs in schools, churches, and buildings too large for the ordinary jobs.

They maintain an engineering department that will assist on plans and layouts as well as advice and information of any kind pertaining to heavy duty heating.

This company is not new in this field, as a few years ago they made a furnace of this type, some of which are still in service after forty-five years of hard service and before the advent of steam and hot water big building heating were the leading people in the horizontal furnace field.

We are assured that this is not their old furnace, however, but they have taken some of the old features that made their product so successful and combined them with the new proven advanced findings in this field.

Any general information on this furnace may be obtained by writing the factory at Monroe, Mich., or writing either to 1654 Monadnock Building, Chicago, or Detroit.

GEORGE F. LANGENBERG
PRESIDENT
EVERETT B. LANGENBERG
VICE PRESIDENT

JOHN J. WALSH
SECRETARY
GEO. L. KLEEBER
TREASURER

REGISTERED
"GOOD BYE" WE'RE GOING HOME NOW
THE FRONT RANK IS HOT
TRADE MARK

LANGENBERG
MANUFACTURING CO.
MAKERS OF
FRONT RANK
TRADE NAME REGISTERED
STEEL FURNACES
AND FURNACE SUPPLIES

MEMBER OF
HEAT
TRADE MARK

4819-4833 EUCLID AVENUE
ADDRESS ALL COMMUNICATIONS TO THE COMPANY
THE CITY SURROUNDED BY THE UNITED STATES
ST. LOUIS

June 13, 1928.

American Artisan,
620 So. Michigan Ave.,
Chicago.

Gentlemen:-

I have read with much interest your various articles on Window Displays for Furnace Dealers, and think the one last week, consisting of a four-page insert on heavy book paper is a "peach" So much so, that I am using the idea in a circular going out over the signature of our salesmen to each of their dealers, copy of which I am enclosing.

I hope you will keep up the good work on this subject, which is one sorely needed by furnace men and in which, I am sure, the manufacturers will be glad to cooperate if you can only get the dealers interested.

With best wishes for your success, we are

Yours truly,

LANGENBERG MANUFACTURING CO.

J. J. Walsh
Secretary.

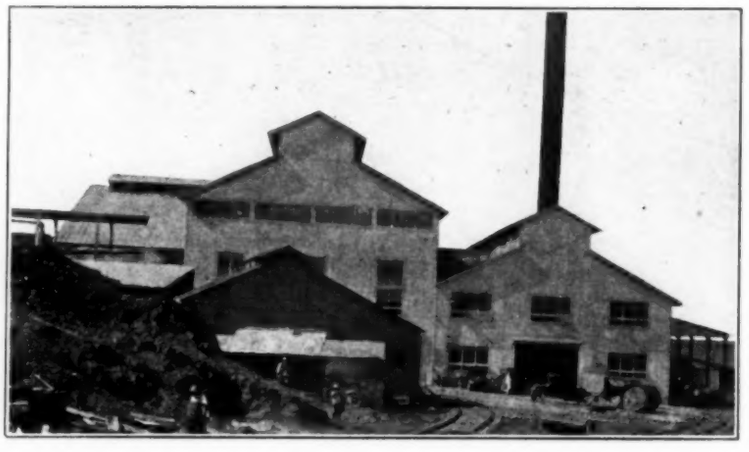
JJW:MW

Some Constructive Suggestions on Uses of Iron in the Production of Sugar

Roofs of Sugar Refineries in Philippines Must Resist Corrosive Action of Salt Air

MY direct interest in observing the sugar industry in the Hawaiian and Philippine Islands is from the viewpoint of the employment of iron in the construction and equipment of sugar mills.

In Hawaii as in the Philippine Islands, the sugar industry dominates the whole economic existence of the country. No matter from which angle it may be viewed, one cannot fail to perceive very quickly that whatever influence other business activities may be exerting on it, no matter how prominent or conspicuous they may be in the public eye, sugar remains the backbone and nerve center of the economic organism. There are others that loom almost as important: pineapple in Hawaii, cocoanuts and tobacco in the Philippines—but their growth and development have been possible only on the foundation furnished by King Sugar.



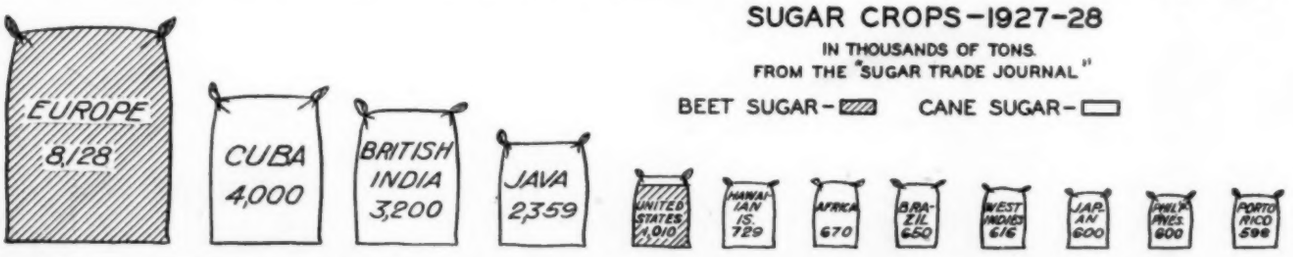
The Buildings of the Hilo Sugar Company, Hilo, Hawaii, Are Located Right Next to the Ocean on the Sea Wall. The Iron Roofing and Siding Is in Very Good Condition, Even Though Subjected to the Corrosive Salt Conditions.

Mills and plantations in Hawaii invariably form part of the same enterprise. In the Philippines the mills raise but a trifling fraction of the cane which is crushed by them. The sugar planters or "hacienderos" bring their cane to the "central", and stand in about the same relation to its management as the grain farmers bringing in their corn to the local flour mill.

In respect of the methods of cultivation employed, Hawaiian plantations are seen to be somewhat ahead of the sugar haciendas of the Philippine Islands. In the latter the ponderous carabao (water buffalo) is still the main source of motive power employed. The labor system is vastly different, too. With the Filipino haciendero, the members of his family still largely form the nucleus of his little crew. The yield per acre and the quality of the cane depend largely upon the energy and progressive spirit, or otherwise, of the individual planter. In Hawaii, all the cane handled by the mill is the product of hired labor, welded together into fairly large and efficiently-organized bodies. Concentration and progressive methods employed in Hawaii have made the sugar industry a highly profitable one.

There are many parts of building construction and of mill equipment in which pure iron can be used to advantage. Although pure iron has been in use in Hawaii for a number of years in mill building construction, it has been almost exclusively in the form of corrugated galvanized sheathing. Its usage in the form of plates or pipe or bars is comparatively recent in most cases, although its value has long been recognized in numerous other industries throughout the world.

It is true that the scope of its application in sugar mill equipment is far more limited than in building construction work. The nature of this material and its distinct characteristics must be clearly understood to get the best results out of its use. By this, I mean the longest possible service which spells true



The Tremendous Importance of Sugar Is Indicated by the Estimated World Production Figures: 24,922,505 Tons (Cane and beet) for 1927-28. This Is an Estimated Increase of 1,332,473 Tons Over the Previous Year, According to the "Weekly Statistical Sugar Trade Journal."

economy—the least cost per season of service.

Using Iron Sheathing

Reverting to corrugated iron sheathing for buildings, one thing that struck me, after more than a year's sojourn in the Philippines, is that mill buildings stand mostly unpainted, and painting is only resorted to after the building has been standing for several years. This may be a matter of financial stringency, but oddly enough it happens to be the sounder policy from the standpoint of maximum efficiency. This applies not only to sugar mills, but to all kinds of industrial plants, governmental and private buildings.

In Hawaii, on the other hand, all buildings are painted, and generally speaking, the corrugated sheathing is painted with all possible haste after erection. This is in line, of course, with the general policy of management, in which a neat and attractive appearance is given much consideration. But this policy led to a widespread and deeply rooted impression that painting of galvanized iron is indispensable to save it from destruction, and that galvanized sheet metal, whether iron or steel, will not stand up unless so protected.

It is largely for this very reason, I observe, that, as a general rule, heavier gauge metal is used in the Philippines. The standard in Hawaii seems to be 24 gauge or 1-40 inch, whereas the standard in the Philippine Islands is 22 gauge, or 1-32 inch.

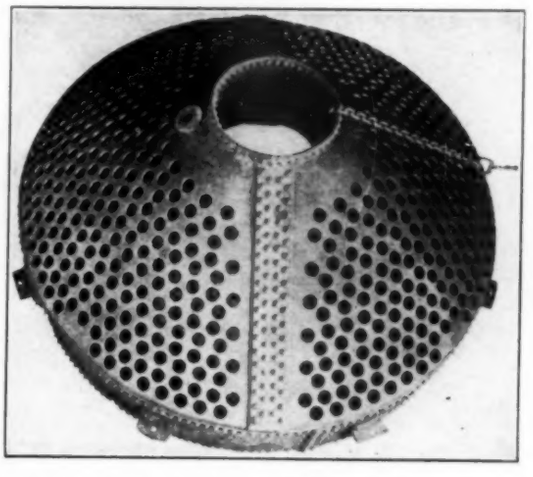
Iron Not Painted

I have seen numerous buildings, industrial or governmental, sheathed with iron, 30 or 40 years old, unpainted, and apparently in no need of such protection today.

A conspicuous example is found in the magnificent plant of the Philippine Refining Corporation, in the building of which pure iron 22 gauge was employed. These buildings stand directly on the salt water, no part of the plant being more than a thousand feet away from the ocean. The bulk of the plant was erected in 1914, and the sheets have never been painted. They are in good condition today.

Metal Buildings Give Good Service in the Philippines, as Shown by This Picture of a Building of the Philippine Refining Corporation, Cebu, P. I. It Was Built of Galvanized Corrugated Iron.

Pure iron gives excellent service under normal conditions, whether painted or unpainted. There are many old buildings in the Islands in which the metal is in excellent condition, but painted over so that the surface of the metal cannot be properly examined. On the other hand, paint sometimes covers up a multitude of sins.



One of Eight Calandras for Vacuum Pans, Furnished for Use in a Sugar Mill by Joseph Oat & Sons, Philadelphia. The Material Can Be Flanged, Dished, or Otherwise Worked. It Possesses Ductility.

My object is not to establish a contention that painting of corrugated iron sheathing is superfluous, only that it is of secondary importance. Leaving aside painting for appearance sake, it serves a useful purpose in preserving the material, and often is the means of prolonging the effective service of sheet metal for an appreciable stretch of time, thus making it a good investment.

While the zinc coating is fairly fresh and solid, a coat of paint superimposed on it wears out without serving any useful purpose. The most effective, logical and costly protective coating for sheet metal is pure zinc, applied in molten condition. Its value as a preservative for ferrous metal surface is not based on merely covering up. Its function is not that of a shield. Its value lies in its electro-chemical relation to iron by virtue of which the iron base is maintained in a passive or inert condition, while the zinc is (more or less) slowly eaten away. When the zinc is about gone, threatening to expose the base metal to the elements, it is time enough then to supplement it with a film of paint.

Extra high quality oil or cellulose paints, in reality enamel, may have such excellent cohesive properties that they will form an unbroken film for quite awhile after the metal beneath it is eaten right through. But such paints are very costly; no one would apply them on a mill building. It is cheaper to buy good iron in the first place. In the

last analysis, it is up to the base metal.

Choosing the Gauge

Recently I had occasion to inspect several huge ventilators of a Hawaiian sheet metal shop, and upon inquiry found that they were intended to go over a large sugar mill building. Ventilators over a sugar mill are subjected to especially severe service in view of the fact that all the acidulated steam, gases, and generally salty atmosphere are driven through these ventilators day and night, with considerable condensation.

At least 22 gauge material should have been used on these ventilators. Each one cost over $100. The bulk of this cost is labor. By the time these unwieldly sheet metal structures are carted to Maui and set up on the top of the mill, they should cost no less than $125 apiece. Twenty dollars would have covered the cost of making them in 22 gauge instead of 24, and that additional investment might in this instance reasonably have doubled or even trebled the effective service of these ventilators.

Corrugated roofing and siding has too long been regarded in the light of a non-permanent, or at best, semi-permanent structure which must needs be replaced from time to time. There is fundamentally no reason for this position, and it did not become prevalent until 25 or 30 years ago. Corrugated iron should be installed with the idea of standing up every bit as long as the building itself is expected to stand up. The user must select the material with the definite object in view of making it a permanent structure.

Iron Equipment

Although iron has a great field of usefulness as sheathing, it is also an important material for use in sugar mill equipment. It is often employed in the heavier gauges in such parts as calandrias and evaporator cell tube sheets.

In July, 1914, five evaporator cells at the Kaiwiki Sugar Mill, Ookola, Hawaii, were equipped with tube sheets of 6 feet 7 inch diameter, cut from pure iron plates, and punched for copper tubes. This was purely an experiment of the Honolulu Iron Works, one of the steps in their incessant work of improvement and development of sugar making machinery. The five evaporators were installed at the sugar mills of Kaiwiki and Laupahoehoe.

Just recently, after about thirteen years of continuous service, one cell in each mill was dismantled, and the condition of the tube sheets inspected. The iron plates in both instances were found to be in good condition.

The conditions of service in syrup evaporator cells are extremely severe on any kind of metal. The plates are subjected to the action of constantly-boiling sugar juices and of gases liberated in the process on one side, and that of acidified vapors emitted by the juice on the other. So destructive is the combined action of the boiling juices and vapors, that instances have been recorded where solid copper tubes of No. 14 Stubbs gauge, 2⅛ inch O. D. subjected to them were eaten through inside of one year.

As for steel pipe, a case was recently reported of 18-inch vapor pipe of ¼ inch thickness being eaten up beyond repair in less than two seasons.

An inspection of four dismantled tube sheets showed that nowhere was the iron pitted through inherent corrosion: i. e., corrosion propagated within the metal itself. The most serious destructive action occurred because of electrolysis generated around the copper tubes where the pure iron came into direct contact with copper in the presence of acidulated moisture. From the full original thickness of the plate in the outer circumference, the metal sloped and thinned down toward the tube holes. While the spaces between the tube holes retained their thickness, the edges of the latter were worn down to the extent that some of the tubes were no longer held tight.

Engineers' Reports

Engineer Girvin reports: "The bottom sheet was most affected, and had many tube holes so eaten away that the tubes could not be kept tight in place. At no place was the sheet eaten through. The sheets in No. 2 cell have not given any trouble. Tubes do not leak. The surface of the top sheet shows some signs of corrosion, but the sheet is still good."

Engineer Dargie of Kaiwiki Sugar Mill reports: "Tube plates in No. 3 cell seem to be in fairly good condition, although there are grooves around all the tubes on the upper plate about 3-16 inch deep. I cannot state how many more years they can remain in service, as part of the lower plate cannot be seen unless the bottom of the cell is removed."

There is nothing strange in this phenomenon of the grooves encircling the tube holes. It is quite in line with, and easily accounted for by, the electromotive relationship existing between copper and iron, the former being electro-negative to the latter. Just as zinc plate in contact with iron in an acid moisture proceeds to disintegrate, sacrificing itself while protecting the iron because it is electro-positive to the latter, so will iron be sacrificed when electrolysis is stimulated between it and copper, due to the difference of potential or "head" between the two metals.

A similar example is the old-fashioned wash boilers, made of iron with copper bottoms. Here the iron usually was worn out the faster. The copper bottoms stood up well all right—at the expense of the iron—but the baser metal would go out all the quicker at the joint, thereby debasing itself still further in the eyes of users, and establishing more firmly the reputation of copper as supremely imprevious to corrosion.

As a matter of fact, when subjected to certain chemical reagents, copper will disintegrate faster than pure iron. This has been observed in the effect of mine waters on the respective metals, as borne out by

the tests conducted jointly by the Carnegie Institute of Technology and the United States Bureau of Mines (Bulletin No. 4, "Corrosion Tests on Metals and Alloys in Acid Mine Waters, 1922"). In these tests, the loss of metal per day for pure rolled copper was 7.4 per cent higher than for pure iron. It has been found iron tubes will often outlast copper tubes in tar still condensers.

Insulating Iron and Copper

An interesting case recently cropped up showing the effectiveness of insulation of iron from direct contact with copper. An engineer was called to Worcester, Massachusetts, to inspect the feed water heater of a large laundry. The plant manager complained that this heater, made of pure iron, had begun to rust badly after only two years' service. The engineer, climbing inside the boiler, found electrolysis to be occurring at the trap between some copper pipe and the iron shell. Under his directions, these copper pipes were insulated from the boiler. The trouble stopped immediately.

The conclusion derived from the inspection of the tube sheets of the evaporator at the two Hawaiian mills is that pure iron will afford as good inherent resistance to corrosion as brass plates or calandrias in this equipment, provided the tube sheets are insulated from the copper tubes, thus offsetting electrolysis. At the same time, pure iron tube sheets possess the advantage over brass in that they can be repaired and built up indefinitely, while brass plates, once pitted through have to be scrapped.

In addition to this, pure iron possesses remarkable ductility which permits its being worked up into very difficult patterns. It can be flanged or dished in its cold state as easily as the best old-fashioned charcoal iron, without injuring the texture of the metal.

The experiment of the Honolulu Iron Works has been valuable, and will, no doubt, crystallize into some action and further research. Such experiments are slow in practical development before producing any radical changes in standardized practice, but they are all the more sure and far-reaching when their application is once definitely established.—L. J. Lewery in *Pure Iron Era*.

Here's a Little Boost for Sheet Steel

The following item appeared in the June 9th issue of the Prairie Farmer:

A pressure tank for water supply can be built of cement, but it is rather a fussy job, and if well done will be quite expensive. We do not recommend it, as a steel tank is better, costs less, and is much less trouble.

What Will Be Required of the Future Successful Business

According to an article in Net Results, "the successful businesses of the future will be the businesses that improve the processes and reduce the costs of production, rid distribution of its present indefensible waste, bring the price of the necessities of life lower and lower, shorten the hours of labor and enlarge the margin of leisure, eliminate periodic depressions and recurrent unemployment, limit the area of the industrial battlefield and enlarge the floor space of the council chamber, create better and better working conditions, pay higher real wages, and increase the comfort and prosperity of both their employes and their customers."

Tinned Seams Are Best for Copper Roofing

Tensile tests of lap seams and of flat lock seams in copper roofing were made recently at the Bureau of Standards by the Research Association of the Copper and Brass Research Association. According to the Bureau it was found that neither the direction of rolling the copper, nor the kind of flux used, bore any relation to the seam strength. Variations in the thickness of the copper or the amount of solder used had only a small effect.

Pre-tinning the edges of the copper sheets, however, resulted in a remarkable increase in the strength of flat lock seams. Pre-tinning with tin or with solder was equally effective.

Detroit Sheet Metal Association Off to St. Clair Flats July 25 and 26

The June meeting of the Detroit Sheet Metal and Roofing Contractors' Association was held in the Savoy Hotel, Detroit, recently. The principal concern of the assembly was the annual summer outing of the association. It was decided to hold the annual pow-wow at Miller's Hotel, St. Clair Flats, July 25th and 26th. A committee consisting of Bill Amelung, Tom Dantz and Al Berschbach, Jr., was instructed to make a trip to the Flats to complete arrangements with Mr. Miller.

The President and Secretary, together with the State Secretary, were included in the committee appointments. As many will recall, this is at the same site that the State Outing was held last and it was a unanimous suggestion that all members of the State Association be invited to attend this function.

Frank Daly and Adam Schepper are of the opinion that many of the state members will be pleased to attend and suggest that those who wish to go, get in touch with Bill Busch, by letter, at their earliest convenience. It is absolutely necessary that you write Bill so that he can make necessary arrangements at the Hotel.

Several very valuable prizes have already been offered by manufacturers and jobbers and any others wishing to contribute a prize should communicate at once with Bill Amelung in care of the Chase Brass & Copper Company, Detroit, Michigan.

Random Notes and Sketches
By Sidney Arnold

"The essence of humor is sensibility; warm, tender fellow-feeling with all forms of existence."—Carlyle.

I saw Ralph W. Blanchard the other day. You know Ralph. He is the vur, vur peppy President of Hart & Cooley Manufacturing Company. He was telling me about his trip out to Des Moines, but just then A. B. Meston, Des Moines, happened along who it seems had come to Chicago on the same train with Ralph. Mr. Meston told me that Ralph had had a very bad night in the sleeper, because the berth on one end of his was occupied by a colored gentleman who snored furiously and the berth at the other end of his was occupied by a newly married couple. He was quite annoyed about it, because the newly married couple boarded the train about eleven in the evening and a good share of the rice that was thrown at them got between his sheets.

* * *

Following that it occurred to me to ask the question, after reading a news item about a couple newly married in Maine who travelled all the way to Boston, Massachusetts, handcuffed to each other, who held the key to the handcuffs? I admire the frankness of this young couple who can face the fact that they are handcuffed for life.

* * *

But on the other hand, I am sure you will agree with me in that the judge was justified the other day in stopping the movement against the green grocer (not the cheese) who was charged with beating up the government inspector when the former made the following reply to the question of the judge, "What have you to say?" "I have nothing to say. I am guilty. I lost my head. All morning I had held my temper while government agents inspected my scales, tasted my butter, smelled my meat, graded my kerosene. In addition, Your Honor, I had just answered three Federal questionnaires. Then this bird came along and wanted to take a moving picture of my cheese and I pasted him in the eye."

* * *

And then speaking of close shaves, I'm so glad that Wilson H. Fisher, 212 Parkway, Niles, Michigan, sent me that razor blade. I can't begin to say how much I appreciated his thoughtfulness, especially now that the hot weather has hit Chicago in earnest. The service he rendered me thereby enabled me to make myself presentable when T. B. Callahan, sheet metal contractor, 884 East Market Street, Akron, Ohio, came in to pay me a visit on Monday of this week. Mr. Callahan, who was accompanied by his son and his brother who operates a sheet metal shop in Gary, Indiana, has been a subscriber to AMERICAN ARTISAN since 1880 when the paper began publication. He is so to speak a charter subscriber. Mr. Callahan and his son are spending a portion of their vacation with the former's brother in Gary. While in Chicago they also visited the Robinson Furnace Company. I hope that other sheet metal and warm air heating men who are passing through Chicago while on their vacations or business will not neglect to pay me a visit. Our office is conveniently located on Michigan Avenue.

* * *

And now for the benefit of men in the sheet metal and warm air heating industries who are looking for ideas about vacations I'm going to spill a few beans which it would never do for you fellows to allow your better three fourths to read. I overheard two men in conversation the other day on the train coming into the city and here's what they said:

Ed.—I've had the best vacation ever. First time in years I didn't have to buy and wear a lot of trick clothes. I didn't have to get baked on a beach, or hike twenty miles to have something to brag about, or pretend that I was at home on a horse, or fight a million mosquitoes to get a six-inch fish.

Jim—What did you do?

Ed.—Not much of anything. Just sat around, talked with the finest bunch of men I ever met, ate the best of food, and got paid for it.

Jim—Kidding me?

Ed.—No, and on top of all that I played poker every night and didn't quit till I felt like it.

Jim—Yes, you did! What did your wife have to say about that?

Ed.—She wasn't with me.

Jim—What, expect me to believe that—you on a vacation without your wife?

Ed.—'Safact. Don't mention it to a soul and I'll tell you. I had to pull some strings to work it and she'd kill me if she ever found out. She made all arrangements to go to the beach and I got a summons to serve on the jury.

* * *

I just learned that Charlie Pearson, vice-president of the United States Register Company, Battle Creek, Michigan, has returned from an extended tour of the west coast, which took him into many of the western states Mr. Pearson said he enjoyed his trip very much indeed, and found business in a satisfactory state, with rough spots here and there but with a generally favorable outlook. Mr. Pearson left again on Saturday on a fishing trip in the north.

* * *

The Boosters

During an extremely cold spell in Milwaukee, something gummed the works of a thermometer hung outside the Chamber of Commerce building and the worst it could do was seventy-two above.

Along came Harold Mueller, bundled up to his ears, but still shivering. For a moment he gazed at the thermometer, then turned away in disgust, saying: "Isn't that like the Chamber of Commerce, anyway?"

Takes Exception to Points Raised by W. Spraragen on Welding Processes

Says Welders Are Not Experts But Are Trained to Do a Job

By H. J. Rogers, Lennox Furnace Company

IN my opinion, the article on "Welding Gains in Manufacturing Industry, as Metal Process," by W. Spraragen, secretary of the American Bureau of Welding, published in the June 2 issue of American Artisan, may be misleading to sheet metal workers generally and furnace installers especially.

My thought is that because of the publication of this article readers who are dealers and installers of warm air furnaces may draw the conclusion that if the products listed by Mr. Spraragen can be successfully welded, then steel warm air furnaces also can be more cheaply and better constructed by welding seams and joints than by riveting.

Mr. Spraragen has been careful to enumerate the types of construction which he says have been successfully welded. Careful reading shows that his list includes motor car frames, generators, ships, tanks, bridges and structural steel for buildings. He does not include in it boilers subject to pressure or products subject to high temperatures. It is to this very point that I want to give attention. None of the products mentioned are put to uses similar to steel warm air furnaces and none are subjected to the wide ranges of temperatures common to heating plants and the stresses and strains set up by the resulting contraction and expansion. He also has been mindful of the human element involved in welding when he says: "A new engineer is coming into existence, known as a welding engineer. He must have a thorough knowledge of what materials are suitable for welding . . . proper qualifications for welders and proper inspection and supervision of the final project." He admittedly sees danger ahead unless every step from planning to inspection is in the hands of experts. I believe it to be true that generally speaking welders are not experts in the true sense of the word, but are workmen trained to do a job. Whether they are good or bad workmen rests with the individual.

Much can also be said on the question of inspection. I submit, how is one to know of the depth, strength or completeness of the welded joint by surface inspection? How may one know of the depth to which the joint has been converted into a homogenous mass by examining the surface of the weld? Can one say for certain that the welded joint or lap will withstand the stresses of expansion and contraction and be air, smoke and gas tight by examining the surface of the joint or weld? I very much question it. By the very nature of the operation that is not always possible because so much is dependent on what kind of a job the welder does. He, like the surgeon, can bury his mistakes. I believe that only by examination of a cross section of the joint can it be determined whether the weld is good or bad. In actual practice that, of course, is not possible.

Mr. Spraragen, like other advocates of welding, remains silent on the most important factor involved in welding any product which, at the weld or elsewhere, is subject to contraction and expansion. That factor is the complete change in the physical properties of the metal welded by reason of the intense heat applied in the welding process. This heat produces in the weld and in the metal at the point of the weld a hardening of the metal welded, crystallizes it, removes its ductility and leaves it brittle and likely to break under stress to which it later is subjected in furnace operation.

Proof of the crystallization of the metal and the change in its physical structure can be seen by the naked eye but much better under the microscope and by analysis. The range of the effect of the welding heat on the metal is clearly marked by cross section examination.

Another weakness in the process of welding as applied to a lapped seam of say an inch and one-half or more is this: The practice is to weld merely one edge of the lap and not the whole width of the lap. In other words, on such a joint the edge of the lap is little more than sealed with the molten rod run against and under the edge of the uppermost sheet.

Mr. Spraragen says frankly that "the depth of the penetration of the molten metal is not great, usually not more than one-eighth of an inch." Examination of welded joints of steel warm air furnaces shows even less penetration than that and there is ample room for argument on the question of the homogeneousness of the mass. Examination of joints such as described discloses little or no mixing of the metals on homogeneousness of the mass.

Numerous tests with cross section samples to establish at what point the break first occurs under stress shows that in blue annealed steel sheets of 6 to 8 gauge the breaks usually first occurred at the edge of the heated area or in the weld itself. These tests also showed that the weld usually broke first, although the unaffected portions of the sheets were amenable to the severe strains and bent without breaking. Analysis, microscop-

Is Warm Air Heating Industry Treating the Public Fairly?

Public Buys Standard Goods for Most Part and Advertising Sells 'Em

By Alfred L. Jordan*

I ALSO might say: "Is the warm air industry going to allow the public to treat it unfairly?"

The American public is fair. They are intelligent and are constantly reading national advertising to learn how much more they can make themselves comfortable. They have been taught to read national advertising to discover these things for themselves.

Assuming this to be true, how is the public going to know of the superior advantages of the modern warm air system? It is fairly impossible to get enough salesmen to tell everyone of these superior merits of the Standard Code job; and even if it could be done, the voice of national advertising is much more powerful.

Our competitors realize the true merits of the correctly installed warm air system—and especially of the forced air system. They know that if this highly improved warm air system gets even a toe hold, that the radiator systems will become comparatively obsolete in the average home. That is why just one member of that industry is launching a tremendous advertising campaign. They also know that when one picks up a prominent magazine that there will not be one word concerning warm air, and their advertisements are leaving a vague impression on the readers that Warm air is something to be avoided and even ignored. In other words, this advertising is still furthering prejudice against warm air.

In a lecture on advertising, I heard Dr. Kincaid—professor of business economics of the University of Virginia—say that the lack of advertising creates more prejudice against a commodity than any other one thing.

Now, I believe, this lack of advertising is the root of all the trouble in our industry. Of course, bad installations have hurt to a great degree, but the lack of advertising hurt much worse than the bad installations.

It is the policy of many businesses and families to buy only standard goods. They will have nothing to do with other than standard goods. Standard goods are considered by the public to be nationally advertised goods. Therefore, warm air is not standard, and a great market is lost to our industry.

Since the great majority of the public does not know that warm air supplies humidity, but think that it is "dry" heat, are we not doing the people an injustice by not telling them through the press? Is it not doing them an injustice by not telling them that the air is kept pure and in constant motion? Also, is it not doing them an injustice by not telling them that a fan can be installed in this system—which not only increases the capacity of the heating system, but serves as a cooling system in the summer?

Then, how does the industry expect the public to treat it fairly, if they don't know of these wonderful advantages of the warm air system? How will they know whether or not they are going to get a cheap job or a Standard Code job, unless they are told about it? If they get stuck once by a bad job, will they bite and buy a good one? If the public gets to know as much about the installation of warm air systems as they know of the mechanical parts of an automobile, a bad job will never go in, and they will know how absurd it would be for a salesman to tell them that a twenty inch firepot could be used in a twenty-two inch furnace. The only solution is to tell the story constantly through magazines of great circulation.

Moral: If an industry treats the public fairly, the industry will be treated fairly.

Relative to the national advertising referred to by Mr. Jordan, I want to say that the Better Business Committee of the National Warm Air Heating Association is working out a plan which will include advertising of this character. The plans of the committee are not yet in a state where they can be given to the warm air heating industry in general. In the meantime, I hope that Mr. Jordan and others who are watching developments closely, will not hesitate to continue to send in their ideas on the subject. By so doing, they will show the committee that they are keenly interested. — The Editor.

*W. B. Jordan & Son, Lynchburg, Virginia.

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ic examination and these tests all prove the contention that the physical structure of the sheets at the weld is changed by the welding heat to a hard, unyielding brittle mass.

As to welding of structural steel, such a recognized authority as Col. W. A. Starrett says in the June 9 issue of the *Saturday Evening Post*. "Welding by electric arc is a new process not yet in use in metropolitan building. . . . . A five-story building at Sharon, Pa., is the highest and a building of the General Electric Co. at Philadelphia is the largest yet erected by this process.

Beyond question, welding has its place and its uses and also its limitations and it is well to look carefully into the limitations, especially if one is to play safe.

How to Calculate Volume of Air Fan Will Handle for Given Building

By T. W. Torr*

HAVING figured the heat loss from the building the volume of air the fan will have to handle can now be figured. The specific heat of a pound of air at constant pressure is 0.2415 and the weight of one cubic foot of air at 70 degrees is 0.0749 lbs. One B. t. u. will raise the temperature of one cubic foot of air:

$$\frac{1}{0.2415 \times 0.0749} = 55.2^\circ \text{ F.}$$

(The above calculation is based on air at 500 feet above sea level. If higher altitudes are being considered the weight of air at the given altitude would have to be used in the calculation.)

That is, one B. t. u. will raise one cubic foot of air 55.2 degrees, or one B. t. u. will raise 55.2 cubic feet of air 1 degree.

It is good engineering practice to consider the specific heat of a pound of air as 0.24; that one B. t. u. will raise 55 cubic feet of air 1 degree and that the weight of a cubic foot of air at constant pressure at 70 degrees will weigh 0.075 lbs.

We must now know the temperature rise; that is, the difference between the temperature entering the return air duct system and the temperature at the warm air duct outlets. In general practice this will be 65 degrees at the intake and 140 degrees at the outlet. Our formula for figuring the volume of air will be:

$$Q = \frac{55H}{60(t2 - t1)}$$

Where Q = Amount of air in cubic feet per minute.

H = Total heat loss in B. t. u. per hour due to transmission and infiltration.

t2 = Temperature of air at outlet.

t1 = Temperature of air at intake.

60 to reduce from hours to minutes.

Assuming a heat loss of 320,000 B. t. u per hour, that t2 = 140 degrees and t1 = 65, then

$$Q = \frac{55 \times 320{,}000}{140 - 65} = 234{,}666$$

Cubic feet of air to be handled by the fan per hour. 234,666 divided by 60 = 3911 cubic feet per minute.

The volume of air can also be figured in weight by the use of the following formula:

$$W = \frac{H}{.24\ (t2 - t1)}$$

W = Weight of air to be circulated per hour.

.24 = Specific heat of a pound of air.

Substituting our values:

$$W = \frac{320{,}000}{.24 \times 140 - 65} = 17{,}777$$

pounds of air per hour.

17,777 divided by 60 = 296 lbs. of air per minute.

A pound of air contains 13.5 cubic feet at 500 feet above sea level. At higher altitudes a pound contains more cubic feet. 296 × 13.5 = 3996 cubic feet of air per minute.

The two methods produce practically the same result. The weight, or second method, is the more accurate of the two.

By carefully calculating the heat loss from the building or the rooms into which it is divided the volume of air for such space can be figured by the use of either one of the above formulas.

CHAPTER IV

Sizing the Duct System

After determining the required volume of air to be delivered to the space to be heated, the duct system will have to be proportioned to give the best result according to the requirements.

A duct system can be worked out on the basis of a desired static pressure. This method is desirable when it is necessary to keep the horsepower to drive the fan to a definite amount.

The horsepower to drive the fan in the type of heating we do is not great so this system is not often used. For our practice we construct the ducts according to the desired velocity then figure the resistance the fan will have to work against.

Let us assume a building 50 x 100 with a 15 foot ceiling, divided lengthwise into two rooms. The heat loss from one room will be 120,000 B. t. u. and from the other side 200,000 B. t. u., heat losses being figured according to Chapter II, "Heat Losses from Buildings."

The heater is to set in the end of the building. Round ducts are to be extended the long way of the building and there will be five openings from each duct, one at the end and four others taken from the sides of the main duct. Two of them twenty feet from the end and the other two forty feet.

The velocity through each opening is to be 500 feet per minute. The temperature rise will be from 65° to 140°. The heat loss from the smaller side is 120,000 B. t. u. per hour.

Applying the second formula of Chapter II:

$$W = \frac{H}{.24\ (t2 - t1)}$$

$$W = \frac{120{,}000}{.24 \times (140 - 65)} = 6666$$

pounds of air per hour. 6666 divided by 60 = 111 pounds of air per minute. 111 × 13.5 = 1498 cubic feet of air to be circulated per minute through the duct system for the smaller side of the building. To simplify our calculation call it 1500 C. F. M.

*Heating Engineer, Rudy Furnace Co.

There are to be five openings so we will have 1500 divided by 5 = 300 C. F. M. thru each opening.

The following rules apply to volume, velocity and area:

1—Volume (cu. ft. per minute) divided by velocity (ft. per minute) gives area in sq. ft.

2—Area (sq. ft.) times velocity (ft. per minute) gives volume (cu. ft. per minute).

3—Volume (cu. ft. per minute) divided by area (sq. ft.) gives velocity (ft. per minute).

Volume = C. F. M. (cubic feet of air per minute).

Velocity = F. P. M. (feet of air per minute).

Applying the first rule:

300 C. F. M. divided by 500 F. P. M. we have .6 sq. ft. area or 80 sq. in. for each of the five outlets. A 10 in. round pipe has an area of approximately 80 sq. in. In practice we would use this size for each outlet.

To arrive at the size of the main duct to have equal carrying capacity of the five openings we will reduce the openings as we come to them to an equivalent number of 5 in. round pipes. The last opening will be a 10 in. pipe and will extend back to a point where the next two 10 in. pipes are taken off and will then be enlarged to have equal carrying capacity of the three 10 in. pipes.

The first 10 in. section is equivalent to 5.7 5-in. pipes. The second section of the main duct will be equivalent to 3 10-in. pipes or 17 5-in. pipes, or a 15 in. round pipe.

Continuing back with the 15-in. round pipe until we come to the next two 10 in. openings, we now have the capacity of 5 10-in. pipes or 28 5-in. pipes, which is equivalent to a 19-in. round pipe.

Our main duct for the smaller side of the building will be 19 in. in diameter until it reaches the first two outlets, then it will be reduced to a 15 in. pipe and continue until the next two openings are reached. It will then be reduced to a 10 in. pipe for the last section.

To figure the duct for the larger size we proceed as before:

$$W = \frac{200{,}000}{.24 \times (140 - 65)} = 11{,}111$$

divided by 60 = 185 × 13.5 = 2497.5 or 2500 C. F. M. total volume of air to be delivered through 5 openings or 500 C. F. M. through each opening. At a velocity of 500 F. P. M. we have 500 divided by 500 = 1 sq. ft. or 144 sq. in. for each opening.

A 13½ in. round pipe has an area of approximately 144 sq. in. In practice we would use a 14 in. pipe for each outlet.

The size of the main duct is arrived at as just described:

1—14 in. pipe = 13—5 in. pipes.

3—14 in. pipes = 39—5 in. pipes or a 21½ in. pipe.

5—14 in. pipes = 65—5 in. pipes or a 26½ in. pipe.

In practice we would use a 14 in. pipe for the last section, a 22 in. for the next and a 27 in. for the largest section, which is to have equal carrying capacity of the 5—14 in. openings.

The 19 in. pipe and the 27 in. pipe can now be combined to arrive at the size of a single pipe to extend back to the heater.

A 27-in. pipe is equivalent to 68 5-in. pipes. A 19-in. pipe is equivalent to 28 5-in. pipes. 68 + 28 = 96 5-in pipes or a 31-in. round pipe.

The main ducts and the openings have now been figured so there will be the correct volume of air at the desired velocity flowing into each side of the building at the estimated temperature to carry the required number of B. t. u.'s to restore the heat losses.

This table is for the purpose of determining the size of round ducts based on equivalent pipes of 5 in. in diameter.

The method of sizing is described in the preceding pages of this chapter.

Diam. of pipe inches	Equiv. 5 in. diam. pipes	Diam. of pipe inches	Equiv. 5 in. diam. pipes	Diam. of pipe inches	Equiv. 5 in. diam. pipes
5	1	17	21	29	79
6	1.6	18	24	30	88
7	2.3	19	28	31	96
8	3.2	20	32	32	103
9	4.3	21	35	33	109
10	5.7	22	41	34	119
11	7	23	47	35	127
12	9	24	50	36	138
13	11	25	55	37	146
14	13	26	62	38	157
15	16	27	68	39	170
16	18	28	74	40	179

David Lupton's Sons Co. Describes Ventilating of Foundries in New Folder

A new four page folder just issued by David Lupton's Sons Co., Philadelphia, Pa., describes the improvement in the daylighting and natural ventilation of foundries that follows the application of the Pond roof design and Pond Continuous Windows manufactured by the above company. The folder explains in detail the manner in which the Pond roof design utilizes natural air movements to clear heat process structures of smoke and bad air. A copy of the folder can be had by writing David Lupton's Sons.

Code of Ethics of National Association of Sheet Metal Contractors in Booklet Form

Subscribers of AMERICAN ARTISAN who read the report of the National Association of Sheet Metal Contractors convention will recall that a Code of Ethics was adopted by the association.

This Code of Ethics is now in booklet form, and can be had by writing Secretary W. C. Markle, 336 Fourth Avenue, Pittsburgh, Pennsylvania. H. J. Dettmers was the chairman of the Code of Ethics Committee. Other members of the committee were M. F. Lieberman, E. H. Reismeyer, Fred Hartel, Charles W. Pansch.

Steel Market Feels the Effect of Pipe Orders

Sheet Mills Have Slow Week— June Pig Iron Output Down 3%

WITH the Texas Company awarding 65,000 tons of pipe to the Youngstown Sheet & Tube Company and the Atlantic Refining Company 50,000 tons to the National Tube Company, the long dormant oil industry is providing real tonnage for the pipe mills. A 25,000-ton gas line in Kentucky is active, while the 150,000-ton project of the Standard Oil Company from Monroe, Louisiana, to St. Louis is slowly shaping up. Only ten days ago the National Tube Company and Spang, Chalfant & Company divided 50,000 tons for the Empire gas and Fuel Company.

This activity in pipe inspirits a steel market already vigorous, from the standpoint of consumption, for early July. Automotive requirements continue substantial; in fact, in some lines they are pressing enough to restrict the July 4 holiday. Some departments of the farm implement industry—notably tractors—are at capacity. The railroads have been a shade more liberal with track accessory orders, and the rumor is again current that heavy buying of cars and track material is slated for this quarter. Building steel awards at 34,197 tons are above the seasonal average.

Sheet Mills Have Light Week

Save for full-finished sheets for the automobile trade, demand for sheets has been light in all districts. Holiday interruptions will be more pronounced in sheets than in other finished lines. Contracting for cold finished bars for third quarter has been brisk at the reduced 2.10 cent, Pittsburgh-Chicago, price. Hoop and band prices continued demoralized. In the East wide hot strip has sold down to 1.75 cents, Pittsburgh. Preliminary estimates place June freight car awards at about 2,063, which would give the first half year a total of only 26,700, contrasted with 42,165 in the first half of 1927. Last June the railroads ordered 7,440 cars.

Holiday shutdowns this week vary according to the state of demand. Many sheet mills are suspended virtually all week for usual midsummer repairs, while cold finished bar mills are off only one day. Steelmaking operations for the entire industry continue at about 72 per cent. Chicago is off two points this week, to 78 per cent, while Pittsburgh is at about 70 and Buffalo 85.

Pig Iron

Activity in the Pittsburgh pig iron market is subsiding after the large sales of basic iron as noted in the past several weeks. Valley merchant stacks are quoting $16. Some are not hoping to get the business because lower figures, by at least 25 cents, have not disappeared. Bessemer iron sales are limited to single carloads to 150 tons at a time at $17, valley.

At Chicago sellers of northern pig iron have closed several more important tonnages for third quarter but in general forward buying has declined. Spot activity is good. With many smaller melters cautious as to building their stocks shipments are below those of May, but steady, and few holdups are reported. The price continues steady at $18, base, Chicago furnace, although eastern competition is being met by local sellers in western Michigan.

Steady selling has been done by Alabama furnace interests since the reduction to $15.50, Birmingham, for No. 2 foundry. Stocks on furnace yards do not exceed 60 days' output.

Copper

The price of 14.75 cents, Connecticut, has ruled for more than a month, and though buying pressure has disappeared meanwhile, shipping pressure continues and the price is firm.

Tin

Users and dealers bought well of early and distant positions in tin. The feeling seemed to spread that the market had made a substantial change and yet there was much uncertainty on how the recovery would hold for the longer run.

Zinc

Prime western was a little more active during the past week but the buying was not large. The price had been pegged at 6.15 cents, East St. Louis, for June shipment nearly all month, with a premium of 5 points recently established for July. A few days ago the price of 6.20 cents was asked and obtained for prompt and July and that became the minimum, with August-September going to 6.25 cents. These are the highest prices quoted in many months. High grade metal is unchanged and a big tonnage of this grade is moving.

Lead

A moderate amount of buying was done nearly every day for early shipment and though there was slight easiness one day on East St. Louis basis, the market remained essentially unchanged and in the past day or two has appeared firmer.

Solder

Chicago warehouse prices on solder are as follows: Warranted 50-50, $31.00; Commercial 45-55, $28.00; plumbers', $25.00, all per 100 pounds.

Old Metals

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, $15.75 to $16.25; old iron axles, $23.50 to $24.00; steel springs, $15.50 to $16.00; No. 1 wrought iron, $11.00 to $11.50; No. 1 cast, $12.75 to $13.25; all per net tons. Prices on non-ferrous metals are quoted as follows, per pound: Light copper, 9½ cents; zinc, 3½ cents; cast aluminum, 12¼ cents.

Chicago Warehouse Metal and Furnace Supply Prices

AMERICAN ARTISAN is the only publication containing Western Metal, Furnace Supply and Hardware prices corrected weekly

METALS

PIG IRON

Chicago Fdy., No. 2	$18.00
Southern Fdy. No. 2	21 51
Lake Superior Charcoal	27 94
Malleable	18.00

FIRST QUALITY BRIGHT TIN PLATES

IC	20x28 112 sheets	$25 10
IX	20x28	29 60
IXX	20x28 56 sheets	16 20
IXXX	20x28	17 55
IXXXX	20x28	18 95

TERNE PLATES

		Per Box
IC	20x28, 40-lb. 112 sheets	$25 00
IX	20x28, 40-lb. 112 sheets	27 75
IC	20x28, 25-lb. 112 sheets	21 15
IX	20x28, 25-lb. 112 sheets	23 80
IC	20x28, 20-lb. 112 sheets	19 55
IV	20x28, 20-lb. 112 sheets	22 05
IC	20x28, 15-lb. 112 sheets	15 05

"ARMCO" INGOT IRON PLATES

No. 8 ga. up to and including ¼ in.—100 lbs. $4 65

COKE PLATES

Cokes, 80 lbs., base, 20x28	$12 60
Cokes, 90 lbs., base, 20x28	13 80
Cokes, 100 lbs., base, 20x28	14 00
Cokes, 107 lbs., base, IC 20x28	14 30
Cokes, 135 lbs., base, IX 20x28	16 40
Cokes, 155 lbs., base, 56 sheets	9 20
Cokes, 175 lbs., base, 56 sheets	10 05
Cokes, 195 lbs., base, 56 sheets	10 90

BLUE ANNEALED SHEETS

Base 10 ga. per 100 lbs.	$2 25
"Armco" 10 ga. per 100 lbs.	4 00

ONE PASS COLD ROLLED BLACK

No. 18-20 per 100 lbs.	$3 75
No. 22 per 100 lbs.	3 90
No. 24 per 100 lbs.	3 80
No. 26 per 100 lbs.	4 05
No. 27 per 100 lbs.	4 10
No. 28 per 100 lbs.	4 20
No. 29 per 100 lbs.	4 35
No. 30 per 100 lbs.	4 45

"ARMCO" GALVANIZED

"Armco" 24 per 100 lbs. $6 15

GALVANIZED

No. 16 per 100 lbs.	$4 20
No. 18 per 100 lbs.	4 45
No. 20 per 100 lbs.	4 60
No. 22 per 100 lbs.	4 85
No. 24 per 100 lbs.	5 65
No. 26 per 100 lbs.	5 05
No. 27 per 100 lbs.	5 15
No. 28 per 100 lbs.	5 30
No. 30 per 100 lbs.	5 70

BAR SOLDER

Warranted

50-50 per 100 lbs. $21 00

Commercial

45-55 per 100 lbs.	23 00
Plumbers per 100 lbs.	25 00

ZINC

In Slabs $ 8 50

SHEET ZINC

Cask Lots (600 lbs.)	$10 75
Sheet Lots	11 75

BRASS

Sheets, Chicago base	18¼c
Mill base	18¼c
Tubing, brazed base	27¼c
Wire, base	18¼c
Rods, base	16¼c

COPPER

Sheets, Chicago base	24½c
Mill base	22½c
Tubing, seamless base	26¼c
Wire, No. 9, B & S Ga.	19¾c
Wire, No. 10, B & S ga.	19½c
Wire, No. 1 1.B & S Ga.	20¼c
Wire, No. 3, B & S Ga. and heavier	19c

LEAD

American Pig	$7 30
Bar	8 30

TIN

Pig Tin per 100 lbs.	$55 00
Bar Tin per 100 lbs.	56 00

HARDWARE, SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES.

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	6¼c per lb.
Mill board 3/32 to ⅛	6c per lb.
Corrugated Paper (250 sq. ft. to roll)	$6 00 per roll

BRUSHES

Furnace Pipe Cleaning

Bristle, with handle, each $0 75

Flue Cleaning

Steel only, each 1 25

BURRS

Copper Burrs only 40-2½%

CEMENT, FURNACE

American Seal, 5-lb. cans, net	$ 45
American Seal, 10-lb. cans, net	85
American Seal, 25-lb. cans, net	2 25
Pecora per 100 lbs.	7 50

CHIMNEY TOPS

Adams' Revolving

	Wt. Doz.	Price Doz.
4 in.	21 lbs.	$11 00
6 in.	24 lbs.	11 50
7 in.	30 lbs.	13 50
8 in.	33 lbs.	15 00
9 in.	51 lbs.	16 50
10 in.	56 lbs.	18 00
12 in.	66 lbs.	22 00
14 in.	110 lbs.	36 00

CLINKER TONGS

Each	$1 50
nace	8 60

CLIPS

Damper

No-Rivet Steel, with tail pieces, per gross	$9 50
Rivet Steel, with tail pieces, per gross	7 50
Tail pieces, per gross	2 40

COPPERS—Soldering

Pointed Roofing

3	lb. and heavier per lb.	40c
2½	lb. per lb.	45c
2	lb. per lb.	48c
1½	lb. per lb.	55c
1	lb. per lb.	60c

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 6B. Net

CUT-OFFS

Gal., plain, round or cor. rd.

26 gauge	30%
28 gauge	35%

DAMPERS

"Yankee" Hot Air

7 inch, each 20c, doz.	$1 80
8 inch, each 25c, doz.	2 29
9 inch, each 29c, doz.	2 60
10 inch, each 33c, doz.	2 80

Smoke Pipe

7 inch, doz.	$1 00
8 inch, doz.	2 20
9 inch, doz.	3 00
10 inch, doz.	3 75
12 inch, doz.	4 50

ADAMS No. 1 CHECK

Check and Collar Complete

8 inch, each	2 00
9 inch, each	2 25

End Check Only

8 inch, each	1 60
9 inch, each	1 85

Collar Only

8 inch, each	50
9 inch, each	65

No. 2 CHECK

8 inch, each	1 00
9 inch, each	1 00

10% Disc. on Adams No. 1 and No. 2 Check

Diamond Smoke Pipe

7 inch, doz.	$ 2 00
8 inch, doz.	2 20
9 inch, doz.	4 80
10 inch, doz.	6 00

Adams' Sheet Metal

7 inch, doz.	$ 1 60
8 inch, doz.	2 20
9 inch, doz.	2 60
10 inch, doz.	2 80
12 inch, doz.	3 50
14 inch, doz.	5 00

EAVES TROUGH

Galv. Crimpedge, crated 75 &	5%
Zinc, "Barnes"	60%

ELBOWS

Conductor Pipe

Galv. plain or corrugated, round flat Crimp.

28 Gauge	60%
26 Gauge	45%
24 Gauge	15%

Galv. & Terne Steel

Plain Rd. and Rd. Corr.:

28 Ga.	60%
26 Ga.	45%
24 Ga.	15%

Square Corrugated

No. 28 Gauge	50%
26 Gauge	35%

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.

Not nested	70 & 5%
Nested Solid	70 & 5%

Sq. Corr., A. & B. & Octagon

28 Ga.	50%
26 Ga.	35%

Portico

1", 1¼", 1½" 45%

Copper

16 oz., all designs 50%

Zinc—

All styles 60%

ELBOWS—Stove Pipe

1-piece Corrugated. Uniform Blue "Milcor" No. 28 Gauge.

	Doz.
5-inch	$1 05
6-inch	1 20
7-inch	1 75

Special Corrugated

6-inch	$1 00
7-inch	1 60

Adjustable—Uniform Blue

"Milcor" No. 28 Gauge. Uniform Blue.

5-inch	$1 65
6-inch	1 75
7-inch	2 10

WOOD FACES—50% off list.

FENCE

726-6-12½% (100 rods)	$23 68
1948-6-14½% (100 rods)	42 62

FILES AND RASPS

Heller's (American)	50-10%
American	60-10%
Arcade	50%
Black Diamond	50%
Eagle	50%
Great Western	50%
Kearney & Foot	50%
McClellan	50%
Nicholson	50%
Simonds	60%

FIRE POTS

Geo. W. Diener Mfg. Co.	Ea.
No. 02 Gasoline Torch, 1 qt.	$ 5 13
No. 0250, Kerosene, or Gasoline Torch, 1 qt.	6 50
No. 10 Tinner's Furn. Square tank, 1 gal.	11 20
No. 15 Tinner's Furn. Round tank, 1 gal.	10 70
No. 21 Gas Soldering Furnace	2 60
No. 110 Automatic Gas Soldering Furnace	10 50

Quick Meal Stove Co.

Vesuvius, F. O. B. St. Louis 30%
(Extra Disct. for large quantities.)

GALVANIZED WARE

Pails (Galv. afte made), 10-qt.	$2 00
Tubs (Galv. after made).	
No. 1	5 75
No. 2	6 50

GLASS

Single Strength, A, 52-in. brackets	85%
Single Strength, B, 24 to 40-in. brackets	80-5%
Single Strength, A, all other brackets	85%
Double Strength, A, all sizes	85%

HANGERS

Conductor Pipe

Milcor Perfection Wire	25%
Milcor Triplex Wire	10%

Eaves Trough

Milcor Steel (galv. after forming) List	plus 12½%
Milcor Sellock E. T. Wire, List	plus 50%

HOOKS

Conductor

"Direct Drive" Wrought Iron for wood or brick 15%

HUMIDIFIER

"Front-Rank," Automatic

In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

LIFTERS

Stove Cover

Coppered per gro.	$6 00
Alaska per gro.	4 75

MALLETS

Tinners

Hickory per doz. $2 25

MITRES

Galvanized steel mitres.

28 Ga.	70
26 Ga.	60-20

NAILS

Cut Steel	$4 25
Cut Iron	4 25

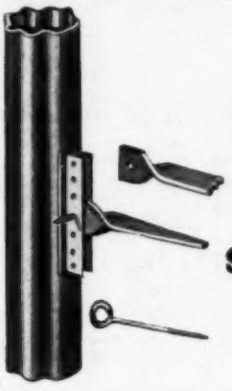
Wire

Common	$3 10
Cement Coated	3 10

(Continued on Page 32)

A. H. K.
FASTENER

HAVE YOU SEEN IT ?



WRITE FOR FREE SAMPLE

FRIEDLEY-VOSHARDT CO.
733-737 So. Halsted St.
CHICAGO, ILL.

VESUVIUS
BLOW TORCHES
in pint or quart sizes.

For Gasoline

With quickly removable soldering iron hooks.

Vesuvius Blow Torches are made of brass or non-corrosive oxydized terne plate. The latter is particularly recommended for hard usage.

Write for prices and illustrated circular today

QUICK MEAL STOVE COMPANY
Div. American Stove Company
825 Chouteau Ave. St. Louis, Mo.

Torrid

"Torrid" Tinners Furnaces

have stood the test of time. Imitations come, go, are changed but "Torrid" standard is unalterable and price always right.

GEO. W. DIENER MFG. CO., CHICAGO
Makers of fine Blow Torches and Fire Pots.

Read the Wants and Sales Pages

Round Corrugated

Plain Round

NEVER MADE WITHOUT THIS TRADE F. Dieckmann MARK

Quality and Service Made 'em Famous

Made of one piece of heavy gauge material, in all styles and angles from 10 to 90 degrees, of 24, 26, 28 ga. ternes, then galvanized after formation.

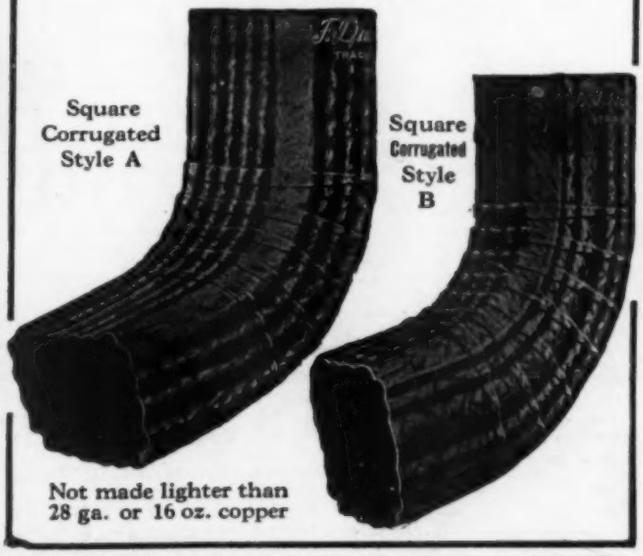
DIECKMANN
Elbows and Shoes
are the standard of the market and always give satisfaction

Send for new catalogue 26 showing complete line

The Ferdinand Dieckmann Co.
P. O. Station B, Cincinnati, O.

Square Corrugated Style A

Square Corrugated Style B



Not made lighter than 28 ga. or 16 oz. copper

ADVERTISERS' INDEX

The dash (—) indicates that the advertisement runs on a regular schedule but does not appear in this issue.

Markets—Continued from Page 30

NETTING, POULTRY

Galvanized before weaving 60%
Galvanized after weaving. 50-10%

PASTE

Asbestos Dry Paste:

200-lb. Barrel	$16 00
100-lb. barrel	8 75
35-lb. pail	3 50
10-lb. bag	1 10
5-lb. bag	60
2½-lb. cartons	35

POKERS, FURNACE

Each $0 75

POKERS, STOVE

Nickel Plated, coil handles, per doz. 1 10
W'r't Steel, str't or bent, per doz. $0 75

PIPE

Conductor
Cor. Rd., Plain Rd., or Sq.

Galvanized
Crated and nested (all gauges) 75-2½%
Crated and not nested (all gauges) 70-15%

Furnace Pipe
Double Wall Pipe and Fittings 50%
Single Wall Pipe, Round Galvanized Pipe 50%
Galvanized and Tin Fittings 50%

Lead
Per 100 lbs. $12 50

Stove Pipe
"Milcor" "Titelock" Uniform Blue Stove

28 gauge, 5 inch U. C. nested	10 50
28 gauge, 6 inch U. C. nested	11 00
28 gauge, 7 inch U. C. nested	12 00
30 gauge, 5 inch U. C. nested	9 00
30 gauge, 6 inch U. C. nested	10 00
30 gauge, 7 inch U. C. nested	12 00

T-Joint Made up
6-inch, 28 ga. ...per doz. $ 4 00

All Zinc
No. 11, all styles 60%

PULLEYS

Furnace Tackle....per doz. $0 85
.....per gro. 8 50
Furnace Screw (enameled) .....per doz. 75

PUTTY

Commercial Putty, 100-lb. Kits $3 50

QUADRANTS

Malleable Iron Damper..... 10%

REDUCERS—Oval Stove Pipe

	Per Doz.
7—6, 28-gauge, 1 doz. in carton	$2 60

REGISTERS AND BORDERS

Baseboard, Floor and Wall.

Cast Iron 20%
Steel and Semi-Steel..... 40%
Baseboard, 1 piece..... 40-20%
Baseboard, 2 piece..... 40%
Wall 40%
Adjustable Ceiling Ventilators 40%

Register Faces—Cast and Steel

Japanned, Bronzed and Plated, 4x6 to 14x14..... 40%
Large Register Faces—Cast, 14x14 to 28x42..... 60%
Large Register Faces—Steel, 14x14 to 28x42..... 65%

Ventilating Register

Per gross	$ 60
Small, per pair	35
Large, per pair	50

RIDGE ROLL

Galv., Plain Ridge Roll, b'did 75-10-5%
Galv., Plain Ridge Roll crated 75-10%
Globe Finials for Ridge Roll..50%

SCREWS

Sheet Metal

7, ½x¼, per gross	$0 52
No. 10, ¾x3/16, per gross	68
No. 14, ⅞x¼, per gross	82

SHEARS, TINNERS' & MACHINISTS'

Viking $22 00

Lennox Throatless
No. 18 ..... 35%
Shear blades 10%
(f. o. b. Marshalltown, Iowa)

SHIELDS, REGISTER

No. 1 "Gem" floor.....$12 00 doz.
No. 2 "Gem" wall..... 6 00 doz.

SHOES

Galv. 28 Gauge, Plain or corrugated round flat crimp...60%
26 gauge round flat crimp....45%
24 gauge round flat crimp....15%

SNIPS, TINNERS

Clover Leaf .....40 & 10%
National .....40 & 10%
Star 50%
Milcor .....Net

SQUARES

Steel and Iron .....Net
(Add for bluing $3 per doz. net)
Mitre .....Net
Try .....Net
Try and Bevel.....Net
Try and Mitre.....Net
Fox's .....per doz. $6 00
Winterbottom's 10%

STOPPERS, FLUE

Common .....per doz. $1 10
Gem, No. 1.....per doz. 1 10
Gem, flat, No. 2....per doz. 1 00

VENTILATORS

Standard .....30 to 40%

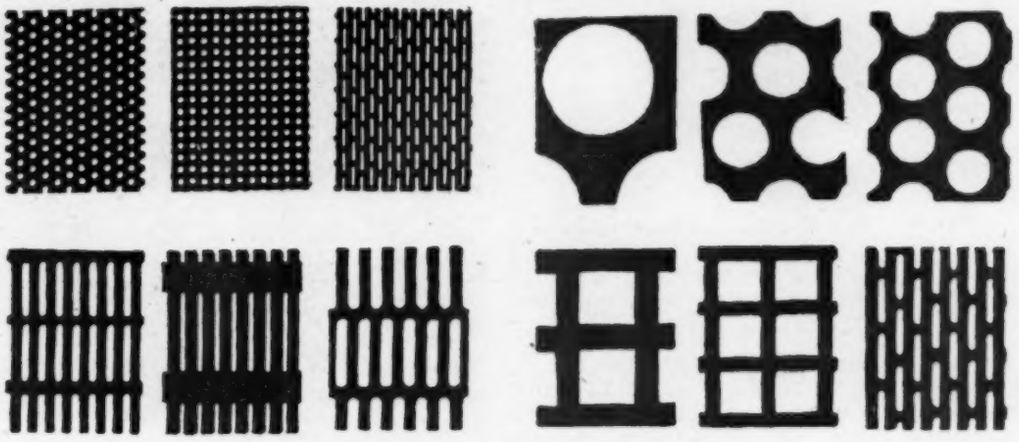
WIRE

Plain annealed wire, No. 8 per 100 lbs. $3 05
Galvanized barb wire, per 100 lbs. 3 90
Wire Cloth—black painted, 12-mesh, per 100 sq. ft.... 1 85
Cattle Wire—galvanized catch weight spool, per 100 lbs.. 3 90
Galvanized Hog Wire, 80 rod spool, per spool 3 15
Galvanized Plain Wire, No. 9, per 100 lbs. 3 35
Stove Pipe, per stone..... 1 10

WRINGERS

No. 730, Guarantee ...each $5 10
No. 770, Bicycle .....each 4 70
No. 670, Domestic ....each 4 35
No. 110, Brighton ....each 3 70
No. 750, Guarantee ...each 5 10
No. 740, Bicycle .....each 4 70
No. 22, Pioneer. .....each 3 40
No. 2, Superb .....each 2 65

PERFORATED METALS



All Sizes and Shapes of Holes in all Kinds and Thicknesses of Metal.
Punched Metal Grilles, Register Faces, Ventilators, etc.
Guard Material for Machines and Belts. We supply a complete line of Accessories
Screens for Grain, Minerals or anything to be screened.
Perforated Tin and Brass always in stock

THE HARRINGTON & KING PERFORATING CO.

5649 FILLMORE STREET, CHICAGO, ILLINOIS, U. S. A.
New York Office: 114 Liberty Street

The NEW IMPROVED "STANDARD"
ROTABLE VENTILATOR

Patented

"Standard" Ventilator and Chimney Cap—Most Efficient Combination on the market.

THIS favorite ventilator has been further improved to insure—

Now made of ARMCO IRON

Greater Durability
Quieter Operation
Greater Efficiency
Better Balance

The **New Cone-top Suspension**, new **Bronze Guide Bushings**, and **Cross Braced Skirt** are the new features.

Let us tell you in detail all about this better ventilator.

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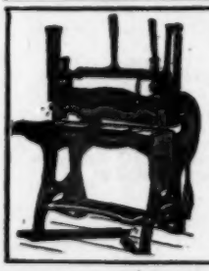

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For Sale—Sheet Metal & Radiator Shop. Good Stock and Fair Business. For quick sale, $550.00. Address R-476, AMERICAN ARTISAN, 620 S. Michigan Av., Chicago, Ill.

For Sale—A flourishing plumbing and heating business in a good town in Central Indiana. Wish to sell on account of ill health. Address Box 227, Flora, Indiana. A-477

SITUATION WANTED

Sheet Metal Worker and Furnace man wants steady position with reliable firm. Can lay out work, estimate and supervise furnace work. Would like to connect with a furnace or heating and ventilating company in the engineering department. A St. Louis Technical Institute man with 16 years' practical experience. Address D-477, AMERICAN ARTISAN, 620 S. Michigan avenue, Chicago, Ill.

Strictly sober, dependable, married, union sheet metal worker and warm air heating specialist desires connection with good live firm where quality work rules. Do layout work when necessary. Steady position in Colorado or adjacent states preferred. 30 years old. 14 years at business. Believe in Standard Code. Address J475, AMERICAN ARTISAN, 620 S. Michigan Avenue Chicago, Ill.

Sheet Metal estimator and salesman desires change. A practical sheet metal worker and layout man. Therefore, knows what it takes to do cornice, marques skylight, blow pipe, heating and ventilation and shop utility work. No building too large. 37 years of age, sober and well educated. Address F-477, AMERICAN ARTISAN, 620 S. Michigan avenue, Chicago, Ill.

Situation Wanted as working foreman by first class sheet metal worker in all branches such as comes to any job shop. Reads blue prints and figures work. Have handled all kinds of tin and sheet metal work for past 25 years. Considered A-1 mechanic. Can furnish best references and will go anywhere. Address P. O. Box 603, Weldon, N. C. X-476

Wanted—Sales connection with manufacturers by middle aged married man with road experience. Familiar with National Standard Code and fan installations. Indiana territory preferred, but not compulsory. State proposition clear in first letter. At liberty July 15. Address Z-476, AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago, Ill.

Sheet metal worker and repair man for such as plumbing, steam fitting and boiler repairs with 15 years of experience wants steady position. Capable and steady. Address H475, AMERICAN ARTISAN, 620 S. Michigan Avenue, Chicago, Ill.

A-1 Sheet metal worker, estimator and layout man, middle aged, wants steady job. Experienced in cornice skylight, heating and ventilating and blowpipe. Please state working conditions. Address Dan Coleman, 1524½ Broadway, Mattoon, Ill. E-477

Situation wanted by first class metal worker and furnace setter. Also A-1 pattern cutter. Can handle men and run shop. Would like to hear from some good reliable firm in need of such a mechanic. Address Bert J. Hawkins, 1000 N. Water St., Owosso, Mich. A-477

Situation wanted by a first class sheet metal worker and tinner. Warm air furnace work and plumbing. Address L-477, AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago, Ill.

SITUATION WANTED

Position wanted by good steady reliable tinner on gutters and furnaces. Chicago or nearby town. Willing worker with good references. Telephone Mansfield 9132 or address M-477, AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago.

Expert furnace installer and all around sheet metal worker wishes steady position. Married, steady and of good habits. Have had 30 years' experience. Can come at once. Address A. J. Baysinger, Lodi, Wis. O-477

Situation Wanted by young tinner and furnace installer. Fully experienced. Wisconsin or Illinois preferred. Address Y-476, AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago, Ill.

Wanted by tinsmith, hardwaremen, bandman, job in store or shop. Kansas or Oklahoma. Address J-477, AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago, Ill.

HELP WANTED

Wanted — Combination tinner and plumber. Must be able to do all kinds of tinning, furnace work and plumbing. Permanent job for the right party. State wages in first letter. Must be able to come at once. Boozer need not apply. Address A. W. Schultz, Fox Lake, Wisconsin. C478

Wanted—A tinner who also has experience in built up asphalt and gravel roofs. Steady employment for a good reliable mechanic. State experience and wages expected. Address Engbergs Sheet Metal Works, Kearney, Nebr. P-477

Furnace Salesmen Wanted—We have an opening for at least two first class furnace salesmen. Splendid opportunity to those who can qualify. Address 126 S. Water St., Owosso, Mich. W-476

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Wanted to Buy—Complete set of tinners tools including an 8 ft. cornice brake. Address H. J. Breunlin, 859 De Kalb avenue, Sycamore, Ill. C-477

For Sale—One 30-inch stove pipe folder, New—$25.00. Address J. J. Martin, Chamois, Mo. S-476

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SITUATION WANTED

Heating engineer, college graduate, 31 years of age, open for position. Thorough knowledge of gravity heating, fan experience with knowledge of research and furnace design. Would make a good man for any company trying to improve its dealers' organization. Best of reference. Address B478, American Artisan, 620 S. Michigan Ave., Chicago, Ill.

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SPECIAL NOTICES

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Sheet metal salesman for Northern Illinois and Southern Michigan to sell our line of Eave Trough, Conductor Pipe and a full line of sheet metal supplies—on commission. Prefer one already established in that territory. Address S-477, AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago, Ill.

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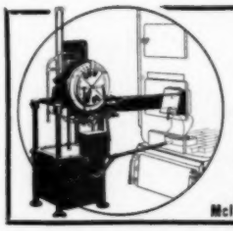

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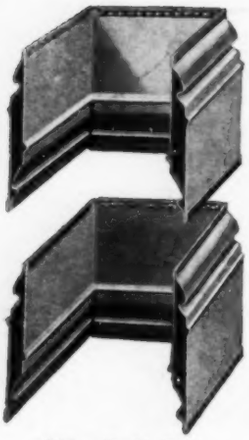

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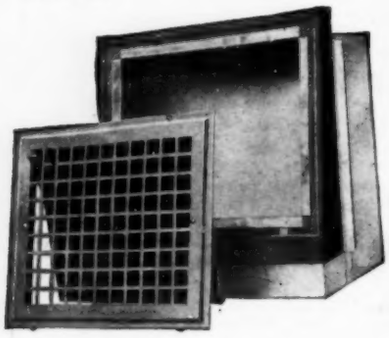

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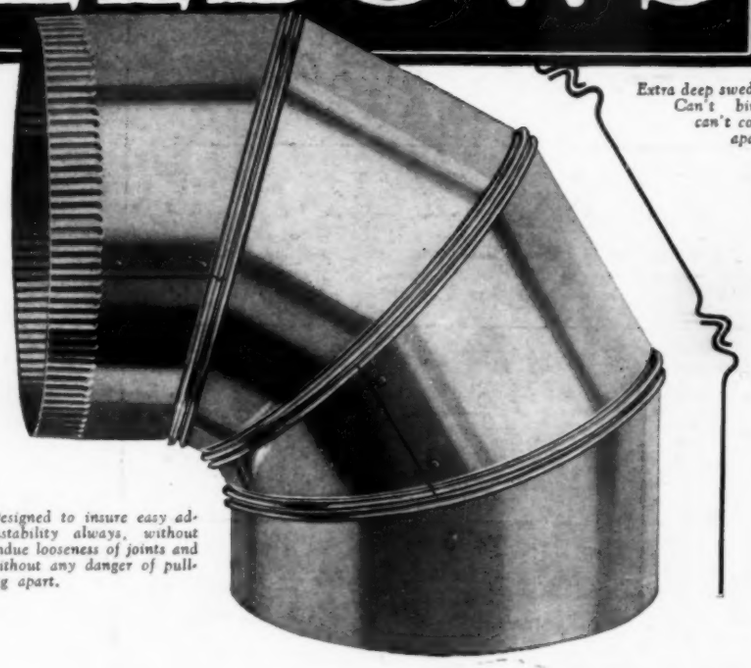

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